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PENNSYLVANIA

# Game News

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SPECIAL ISSUE NO. 4

## *Preface*

IT IS believed that the sportsmen of Pennsylvania are truly interested in the game animals they hunt. It is believed that they are sufficiently concerned to want to know what the Game Commission is doing to protect and preserve this game which provides so many hours of delightful outdoor recreation. This is a report to the sportsmen of Pennsylvania on the findings from three research studies concerning the welfare and management of one of these game animals—the bobwhite quail.

In the past, the findings from similar studies have too often been buried in technical reports of limited distribution. Now it is intended to keep the hunters of the state well informed concerning the work and goals of the Game Commission, so that this knowledge and understanding will help induce a mutual agreement on management policies and efforts.

The three studies included in this report were conducted under the Federal Aid to Wildlife Restoration Act of 1937, and were administered jointly by the Pennsylvania Game Commission and the U. S. Fish and Wildlife Service. At the termination of the original Pittman-Robertson Project in 1947, the Wildlife Management Institute provided funds for the continuation of certain phases of the study. These experiments conducted at the Pennsylvania State College are included in this report and make a valuable addition to it.

The technical assistance of the following persons is gratefully acknowledged: Mr. Ralph B. Nestler of the Patuxent Research Refuge, U. S. Fish and Wildlife Service, who was responsible for the measurements of Vitamin A storage and weights of livers in quail sent to him from Pennsylvania during the course of the study; Dr. E. W. Callenbach and Dr. R. V. Boucher of the Pennsylvania State College for valuable assistance in planning feed formulae for nutrition experiments; Colonel Henry W. Shoemaker for much of the early history of the bobwhite in Pennsylvania; and the personnel of the Soil Conservation Service in Fulton and Franklin Counties for information concerning soils and land use.

To the Conservation Commissions of West Virginia and Missouri, who generously furnished wild-trapped bobwhites for the comparison experiments, we extend our deepest appreciation. And for aid in collecting stomachs and pellets of predators, for assistance in trapping quail, and for the mass of information collected through personal interrogation, we thank all of the Game Protectors, Fish Wardens, sportsmen, and landowners who unselfishly cooperated.

# PENNSYLVANIA *Game News*

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## PENNSYLVANIA GAME NEWS

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Mildred Ross ..... Circulation

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Special Issue No. 4

## THE BOBWHITE QUAIL IN PENNSYLVANIA

By Roger M. Latham and  
C. R. Studholme



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Cover Painting  
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# THE BOBWHITE QUAIL IN PENNSYLVANIA

By

ROGER M. LATHAM

and

C. R. STUDHOLME



FINAL REPORT

PITTMAN-ROBERTSON RESEARCH PROJECTS

NO. 16-R, 35-R, 41-R





## Part I

### INTRODUCTION

THROUGHOUT the latter half of the nineteenth century and the first one-third of the present century, the bobwhite quail prospered in Pennsylvania. In our grandfather's day, market trappers were able to catch quail by the thousands and ship them to the larger cities by the barrel. And this immense number of birds seemed to persist in spite of continuous shooting and trapping and in spite of frequent rigorous winters. As the legal and illegal marketing of the bobwhite was gradually reduced because of legislation and better law enforcement, this pressure was replaced by sport shooting by many thousands of sportsmen who, with the advent of good roads and automobiles, were able to hunt in every part of the state. Probably the total annual take by these men hunting purely for sport equalled, or exceeded, that of the comparatively few market hunters of previous years. Nevertheless, the bobwhite exhibited its tenacity and reproductive ability by maintaining itself in good numbers in spite of this extreme gun pressure.

But, during the nearly unprecedented winter of 1935-36 when the ground was covered with deep snows for weeks and the temperature remained below zero for days, the quail in Pennsylvania, and other states, suffered extreme mortality—probably nearly ninety per cent of the total

population. This loss appeared to mark the beginning of a new and discouraging era in the history of this bird in Pennsylvania, for, since that time, its biography has been characterized by a near-continuous decline. *However, this decline has not been typical of all the northern states, and in some, according to reports, the quail recovered quickly and have remained reasonably abundant even though the climate equals that of Pennsylvania in severity.*

It was to ascertain the cause, or causes, for this comparatively sudden depression and to attempt to formulate management practices which would eliminate, or alleviate, these decimating forces that the Quail Study was instituted. Why had winter mortality assumed these unprecedented proportions, and, even more important, why was the surviving stock unable to increase to normal numbers within the expected two to four years? Unquestionably, some change, or changes, had occurred, and these changes could be of two kinds—within the bird itself, or within its environment. To place properly the responsibility for this crisis of the bobwhite, it was necessary to investigate thoroughly both possibilities. The first possibility—a change within the quail themselves—could perhaps be explained by disease or by a pollution of the hardy native stock by the introduction of artificially

reared or imported birds which were, for one reason or another, below par. The second possibility—a change within the bobwhite's environment—is far more complex than the first. In this case many different influences, representing changes which may have occurred rather abruptly, or slowly over a long period of time, could be responsible for the reduction in numbers. Predation, plant succession, decreasing soil fertility (dissipation of essential mineral elements) and soil erosion, changes in farm practices, greater gun pressure, and other environmental stress could be contributing factors. It was difficult, however, to conceive that these ecological forces have changed so materially

over an entire state in so short a period of time. If there were good numbers of quail in 1935 and very few in 1945, with the trend nearly continuously downward, it would appear that the basic explanation for this depression would be one of more decisive nature than that likely to result from a gradual change in the bird's environment. With the mental deductions as a basis for the research, the activities of the Quail Study were directed toward a curate evaluation of each of the various limiting factors in their relation to the prosperity of the bobwhite in Pennsylvania and toward the creation of counteractive management measures.

## EARLY HISTORY OF THE BOBWHITE QUAIL IN PENNSYLVANIA

The following account of the early history of the bobwhite was compiled by Colonel Henry W. Shoemaker, State Historian:

William Penn, listing the quail among the valuable food-producing birds of Pennsylvania in a letter to a friend in England, wrote, "Of Birds that make good eating we have the wild turkey, bigger than a goose, the pheasant (probably the pinnated grouse), the grouse, and the quail, the last named in immense numbers."

Seth I. Nelson, famous Clinton County hunter, remarked, "Quail were still found in immense quantities when I visited my relatives, the Iredells, at Milton, Northumberland County. I never found many north in the old Black Forest, in Potter County, where I resided as a boy. The Pennsylvania quail were birds of the great open, hard wood forests that had been burned over to make pasture for the bison, and even in my time, I was born in 1809, the ground was covered with tall grass and free of underbrush (such forests stretched for miles along the Chillesqueaque and Limestone Creeks, and in the Buffalo Valley). Many of the pioneers preferred quail to the flesh of the passenger pigeons, and set out bobwhite nets in the fall of the year, with tame quails tied by one foot which kept chirping to draw the flocks to the feed beds, and when the trap was sprung, often a hundred birds would be taken. The

breasts were salted down for winter along with venison, shad, and wild pigeons. In the markets at Milton, live quails were sold at a cent apiece as late as 1830. The quail was a hardy bird and could hold its own from its enemies in the tall Blue Grass."

Says J. S. Quigley, a noted Clinton rambler and hunter, "My people netted quail and fattened them for Thanksgiving; in fact, many preferred them to the wild turkeys usually served on that great day."

Says a lady who resided in Philadelphia from 1855 to 1875, "On market days one could get all the quails one wanted, alive or dead, for about fifty cents a dozen, and costing much more than the common red birds or wild pigeons. We fed our horses mostly on game and fish, which was cheap and plentiful, but gave them [red] meat once a week, as they said they needed."

Says Oliver D. Schock, long a state employee at Harrisburg, "I recall the whistling of the quail on Capitol Hill and in the long grass along the river at Front Street. Seven days hunting was allowed in the fall on Capitol Hill: one day a week for three weeks, I believe it was. Many quails, once in a great while a grouse, also wild pigeons, ground hogs, rabbits, and squirrels were secured. All this was reported in the Harrisburg newspapers, probably as late as 1880. The Harrisburg markets about 1840, I was told, had strings of hundreds of quails hanging up, selling at twenty-five cents a dozen; the live birds in crates along the streets at

but the same price. I came to Harrisburg 1875, and the markets were full of quails, which by then had risen in price, live or dead, to sixty cents a dozen."

The laws pertaining to bobwhite quail in Pennsylvania date as far back as 1838 when a season was provided for two counties, and the sale of birds in markets except during the open season, and the destruction of nests and eggs, were prohibited. The penalty was set at five dollars, one-half going to the informer and the other half going to the county. The word "quail" instead of "partridge" was first mentioned in another county law (Fulton County) passed in 1857. Trapping quail was prohibited in 1869, and the sale of this bird became unlawful in 1897. The first daily bag was also established in 1897, but it was not until 1905 that a season limit was imposed. Also in 1905, it became unlawful to shoot quail bunched on the ground. This method of hunting was called "ground squabbling" and was done mostly at night. With the aid of a torch made by wrapping a large bundle of long, thin pine sticks together, the hunters would track a covey of quail in the snow until they sighted it huddled in the roosting circle, and then the "gunner" would back off to the right distance and discharge the load from his muzzle-loader into the middle of the covey. Many were killed at one time, and several coveys might be visited in one night, and the families of those participating joined together for a quail dinner the following day. It can be said in defense of these men, that these "hunts" only occurred about twice a year, and the birds were not molested at any other time. "Singles" shooting in the daytime was too difficult and too expensive for most of the farmer-landowners to enjoy.

Trapping for market prior to the Civil War was practiced extensively, and one man would often trap several barrels of dressed birds in one winter. These were shipped to Philadelphia, New York, and other large

cities where they sold for a few cents a dozen. Even after trapping had been prohibited by law, many men continued to trap illegally and sold their catch to local residents or shipped them surreptitiously to the larger cities during freezing weather.

Kalbfus (1905) as Chief Game Protector of the Pennsylvania Game Commission wrote: "Six times to my certain knowledge, since I first began to take a special interest in this work, quail, because of severe winters and the slaughter of market hunters, had become almost extinct in Pennsylvania. Six times the sportsmen of this state, as an organization, with a limited number of outsiders, went down into their pockets and furnished the cash wherewith to buy quail in other states and bring them into this state. The same thing has been done every year, to a more or less degree, . . . .

"Four years ago quail for propagating purposes could be secured without limit from almost every state of the South and West; today I can count such states upon the fingers of one hand, the supply being limited from these and the price three and even five times what it was four years ago."

In 1906, Dr. Kalbfus reported that 3,700 quail had been imported from Alabama and released in the state. His 1909 *Annual Report* gave an interesting sidelight on quail: "I know of one gentleman living in Lewisburg, who hired a horse and carriage, at least once a week for more than two months, who bought buckwheat and screenings and other food and who travelled over a route of more than twelve miles, upon each trip, looking after and protecting nine coveys of quail that he had located.

In 1911, he mentions that a most notable increase in quail was reported from many sections of the state, especially from the western and southwestern parts and also from

the central and northeastern portions. (Bobwhites are now practically non-existent in the northeastern counties and rare in the central region).

When bobwhites became unobtainable from the southern states, the birds for restocking were purchased from Mexico. Beginning in 1914, several thousand were imported from that country at a cost of about eighteen dollars a dozen, but a large

number died from coccidiosis during transit and shortly after arrival. In spite of this and other difficulties over 90,000 bobwhites were bought from Mexico, and then the practice was discontinued as artificially-reared birds became available about 1931. Pen-reared stock, purchased from private breeders and propagated at the state game farms, have been used exclusively since that time for restocking purposes.



PGC Photo

*The present aim of the State Quail Farm is to produce a hardier bobwhite.*

Date	Scope	Open Season	Bag Daily	Season Limit	Penalty	Remarks
1838	Adams and Dauphin Counties	Sept. 1 to Jan. 15	....	....	\$5.00	First quail law in Pennsylvania. Prohibited destruction of nests and eggs, and sale except during the open season.
1857	Fulton County	Aug. 1 to Jan. 1	....	....	\$5.00	One of several "county" laws providing protection for quail. First law to use the word "quail" instead of "partridge."
1869	All but eleven counties	Oct. 1 to Dec. 20	....	....	\$5.00	Prohibited trapping quail.
1873	Statewide	Nov. 1 to Jan. 1	....	....	\$10.00	Sale still permitted in season.
1876	"	Oct. 15 to Dec. 15	....	....	\$10.00	
1878	"	Oct. 15 to Jan. 1	....	....	\$10.00	
1889	"	Nov. 1 to Dec. 15	....	....	\$10.00	
1897	"	Oct. 15 to Dec. 15	15	....	\$25.00	Prohibited sale of quail. Outlawed any method of taking quail, except with a gun. Provided for trapping and holding quail over the winter.
1905	"	Nov. 1 to Dec. 1	10	75	\$25.00	Unlawful to shoot quail when bunched on the ground. Unlawful to hunt quail for hire. Weekly limit—40 birds.
1909	"	Oct. 15 to Nov. 15	10	75	\$25.00	
1915	"	Oct. 20 to Nov. 30	8	25	\$25.00	
1921	"	Nov. 1 to Nov. 30	8	25	\$25.00	
1932	"	Nov. 1 to Nov. 30 (staggered during 1932, '33 and '34)	6	24	\$25.00	
1946	"	Nov. 1 to Nov. 30	4	12	\$25.00	





## Part II

### LIFE HISTORY

The normal behavior pattern of bwhite quail (*Colinus virginianus*) known to vary with the changing seasons of the year. The yearly seasonal cycle and the coincident comrnt of the birds will, in a general fashion, furnish the temporal continuity of this discussion of the tail's life history.

#### **"Bobwhite"**

In late April or early May, de-  
nding upon the advent of warm  
eather, the first "bobwhite" calls  
the male quail may be heard.  
These notes are familiar to any one  
o has lived in the country in quail  
rritory. It is the call from which the  
rd derives its popular name. It is  
t heard while the coveys are still  
tact, and is probably not used until  
ter bevy dispersal and subsequent  
esting activities are in progress.

This distinctive call has been  
ought by many observers to repre-  
nt the attempts of unmated male  
ail to attract a mate. There is  
ittle doubt that these cocks do use  
e "bobwhite" notes. However, evi-  
ence that mated males also fre-  
quently use this call was discovered.

was often heard in the immediate  
inity of active quail nests. On one  
casion an investigator watched a  
ng male called from atop a  
nce post. A low answer was heard  
om a nearby stream bank. The male  
mmediately flew well up into the

foilage of an elm tree which stood  
about thirty feet distant from the  
fence post.

From this new vantage point the  
cock uttered the "bobwhite" call  
notes. The soft call came again from  
the stream bank, whereupon the male  
glided from his lofty perch and joined a female quail. Some low-  
pitched, excited chattering ensued,  
and both birds disappeared into tall  
grass. Subsequent search of the sur-  
rounding territory resulted in the dis-  
covery of a quail nest in which six-  
teen eggs were being incubated. A  
male bobwhite, presumably the same  
cock, was observed calling from the  
same location on later occasions.  
After the eggs in the nest had  
hatched, no more bobwhite calls were  
heard in the vicinity. Evidently the  
mated male quail makes frequent  
use of the call throughout the mating  
and nesting seasons, but as soon as  
the eggs are hatched the call is no  
longer given.

When captive quail were held in  
pairs, the males were known to use  
the "bobwhite" call often. These  
birds were mated and the hens were  
laying fertile eggs.

#### **Behavior of Mated Birds**

During most of the year bobwhite  
quail were gregarious, but through-  
out the mating and nesting seasons  
the birds lived as mated pairs.

Once pairing had taken place the

male was very devoted to his chosen hen. He resented the advances of any unmated cock and fought off attempts by other males to lure his mate from him.

On a midsummer afternoon a pair of quail was observed in the shade of a large elm tree on the bank of a stream about 50 yards from their nest. They appeared to be resting and loafing in the shade. A cock quail calling nearby evidently overheard some of the low conversational notes uttered by the pair and decided to investigate. No notice was taken of the intruder by the mated male until the former had approached to within five feet of the female. At this point the mated male lowered his head, dropped his wings and made for the interloper at a fast run, chattering excitedly. The latter hastily withdrew, whereupon the former rejoined his mate. The scene was repeated almost immediately, and the stranger was driven into a nearby corn field before the mated pair reunited. Shortly the pair entered the corn field about 50 yards from the entry point of the unmated male. Another encounter ensued. This time the mated male pursued the unmated cock nearly 75 yards at top speed. No actual bodily contact was observed in any of these encounters although prudent and precipitous retreat on the part of the unmated cock was all that prevented it.

During these encounters the female appeared totally indifferent to the outcome. She at no time took active interest in the proceedings. Conjecture as to the subsequent behavior of the hen, had the outcome resulted in the banishment of her mate, led the observer to believe that the hen would have immediately accepted the victor as a new mate.

Apparently almost any male is acceptable to a hen desiring to mate. During the study, pairs of quail were held captive in separate enclosures for the purpose of checking egg pro-

duction, fertility and hatchability. Several unconfined males wander about the grounds nearby paying attention to the mated pairs in confinement. The cock of one of the pairs died. Before a day had passed several of the unconfined males were seen trying their best to join the now single hen within her pen. Just how the news that this hen was again single, and looking for a mate, was conveyed to the outsiders was not determined.

### Nest Sites

A wide variety of choice in the selection of nesting sites was apparent in the examination of over six hundred quail nests during the spring and summer of 1944 when a fair population of quail existed over much of the study area. Twenty-one nests were found in fields of mixed clover and timothy hay. Nine were located in fallow fields which had lain idle at least one year. The same number were built along the edges of roads. Eight were in alfalfa fields, and one was found in each of the following: a field of barley, a wheat field, a peach orchard, a country cemetery, and a clump of ornamental shrubbery. It appeared that bobwhites might nest nearly any place on their normal range.

The number of nests in hay fields might seem to indicate a preference for this type of nesting cover. However, a high percentage of the total number of nests in these locations was probably discovered during harvesting operations. Even the most diligent search of other types of nesting cover failed to disclose many of the nests undoubtedly located there. The availability of suitable construction materials, and the presence of sufficient plant growth in which to hide the nests, were probably important deciding factors in the selection of any one certain spot by a pair of mated bobwhites.

All but two of the nests examined

ced in a southerly direction as if to enable the hen to take full advantage of the sun, which in early season in the latitude of the study area was south of the zenith. Those located on steep slopes usually opened down hill, while those on gentle slopes were as likely to face in an uphill direction. Most of the nesting sites were on well drained land. None was lost because of drainage difficulties, and only one was so located as to be endangered by surface run-off.

Active nests as close together as thirty yards were observed. Three were found along two hundred and forty yards of the same farm lane. The proximity of nests to one another is dependent upon the nesting bird population and the availability of suitable building sites. A saturation point of quail population was not approached at any time on the study area during the course of the study. However, it was apparent that quail will nest close together if the occasion warrants.

Mr. Carl Hann of Fulton County reported finding twelve active quail nests "a number of years ago" while he was mowing hay in a six-acre field. He said that he was able to raise the cutter bar of his machine and leave a small patch of grass standing at the site of each nest. His neighbors aided him because of the ragged appearance of his newly mown field. However, he stated that his efforts were well rewarded when the setting birds returned to each nest and continued incubation. Mr. Hann was using horses to draw his machinery and the birds flushed before the cutting bar reached them. As progress of the machine was moderately slow, the operator was able to raise the blades and save the clutch from destruction. Had tractor power been used, the rapid movement of the operation and the proximity of the cutter bar to the front of the machine would probably have made it im-

possible to avoid destroying most of the nests.

#### Nest Construction

The use of dead material in the form of grasses, weeds and/or leaves was apparent in the construction of every nest. This material was available within very short distances of the chosen sites. The stems and leaves of the softer grasses of the *Poa* family were widely used. This material was easily woven into the walls and roofs of typical structures.

After a suitable location had been chosen both birds apparently took part in construction. A shallow depression was first dug in the earth. This was apparently accomplished in much the same manner in which "dust baths" are formed. Bills and feet were used to dig the soft earth, and the body was wriggled in such a manner that the sternum of the bird formed a cup-like hollow. One nest on a very steep bank was built in the hoof print of a cow made while the ground was soft. Occasionally the presence of hard objects too large to be moved by the quail hindered the birds in the formation of the wallows. However, the inconvenience was overlooked in at least two cases, and completed nests were found with the neck of a broken bottle and a small piece of farm machinery imbedded firmly in the foundations.

One nest, discovered at the edge of a brier patch, was found to have the small nest of a vesper sparrow attached in such a manner that both birds might incubate at the same time and not interfere with each other. The nests were located back to back, and the sparrow's was furnished with a separate opening. Both were successfully incubated.

#### Nesting Dates

The earliest date on which an active quail nest was found was April 26, when a pair of birds was flushed from the mouth of a newly completed

structure. Construction dates of 59 nests showed that May and June were the peak nesting months. Two nests were completed in April; 25 each in May and June, and 7 in August. Reliable reports were received of hen quail incubating in September. The flushing of immature birds about three weeks of age in October substantiated these reports. The fact that many nests were found during harvesting operations, which were in large part completed by mid-July, and the fact that by this date vegetative growth had reached such a height that it was difficult to discover nests in standing cover, probably accounts for so few being found after that date. Nests active in August were considered re-nesting attempts. Chicks from later nests probably did not reach sufficient maturity to enable them to withstand the cold weather and snows of winter.

#### Egg Laying

Egg laying began soon after the nests were completed. Eggs were laid

at the rate of one per day in nests under observation. Captive hens, at the height of the nesting season, occasionally failed to lay for a day. However, the following day they usually laid two eggs. Hens in the wild may not lay consecutively while completing the clutch.

The completed clutches of eggs varied from ten to thirty. Clutches as large as the latter are unusual and probably represent the work of more than one hen. The average number of eggs in completed clutches was sixteen.

The eggs are of a uniformly white color, noticeably larger at one end. The shells are quite strong, and the tough inner membrane gives the eggs an elastic quality which prevents breakage under normal nest activities. Occasionally very small or "run" eggs were found in bobwhite nests in the field. These eggs did not hatch although they were incubated with eggs of ordinary size which did. Several "cast eggs," or single eggs, laid at random in the field were disco-

*Eggs are laid at the rate of one per day.*

PGC Photo by Studholme



ed. This accidental egg laying is not uncommon, and may occur before nest building is completed. The hens made no attempt to incubate such eggs, nor to protect them in any way. Apparently they were deposited and forgotten.

### Incubation

Several methods of determining if eggs in a quail nest were being incubated were discovered. When incubation had not commenced, the shells were often discolored with brownish stains from damp nest material. The shells of incubated eggs were of a smoother texture than others. It is probable that continued contact with the body of the incubating bird, and the rubbing incident to being turned by the hen, were responsible for this smoothness of shell. The arrangement of eggs in the nests was another good indication of incubation. Those being incubated were nearly always arranged in a single layer upon the floor and about the sides of the nests, while eggs not being incubated were often piled one upon another in haphazard fashion.

The normal incubation period of bobwhite quail eggs has been established at 23 days.

### Behavior of Incubating Quail

The demeanor of the setting bird was a good indication of whether or not incubation had begun, and instead of the degree to which incubation had progressed. Generally speaking, the nearer the eggs were to hatching, the closer the hen would sit upon the eggs at the approach of the observer, although the females showed a great deal of individuality in behavior. Some hens would flutter from the nest in the manner of a wounded bird, dragging a wing and crying excitedly. They stumbled, half ran and half flew, attempting to draw the attention of the observer from their nests. Others showed less agitation. Male quail were less per-

sistent in their attempts to decoy intruders from nests being incubated by their mates. Usually the cocks remained at a discreet distance from the observer, moving about rapidly and calling excitedly until the danger had passed.

A nest of eighteen eggs was discovered along a country road on August 14, 1944. Pictures of the setting bird were taken. She flushed when approached nearer than three feet. However, she did not seem greatly alarmed and shortly returned to the eggs. The next day she was observed but not disturbed. On the nineteenth of the month the hen left the nest quietly while the observer was still some thirty feet distant. Examination of the nest showed that only ten eggs remained. One well incubated egg, showing tooth marks in its shell, lay on the ground about a foot in front of the nest where it had been dropped by an intruder. The hen was back on the nest that same afternoon. She flushed, but returned immediately to her eggs. At 7:00 P. M. she was again disturbed when two poisoned eggs were placed in the nest by the observer. Again she returned immediately. At 1:45 P. M. on the following day the hen had left the nest and only six eggs remained, two of these being the "baited" eggs. At eight o'clock the same morning a dead skunk lay at the mouth of the nest. Here was evidence of high devotion on the part of the setting hen to her eggs. She had been badly frightened a number of times, and had suffered the loss of part of her clutch, yet the desire to continue incubation was strong enough to overcome fear, and the hen returned to incubate until there was no further hope of hatching.

At the other extreme, a hen quail flushed from a nest, containing 15 eggs incubated an estimated two or three days, never returned to the eggs. She was assumed to have deserted. This was the only case in which the mere



PGC Photo by Latham

*The future depends upon her success.*

presence of man about the nest caused a setting quail to desert.

#### Sex of Incubating Bird

In every case in which the sex of the incubating bird was determined it proved to be the female. Other observers have noted cock birds incubating. The observers during the study knew of several nests vacated by the untimely demise of the incubating hens. It was assumed that only the hen had been killed and that the cock knew the whereabouts of the nests. Still in no case under observation did the male take over incubation duties. In defense of the cocks, however, at least two instances of male quail being in sole charge of very young chicks were observed. Reports of similar cases were received. Unfortunately it was not determined whether the cocks had incubated the eggs, or had taken over the responsibility of raising the chicks, at the presumed death of their mates, after hatching had occurred.

#### Nesting Success

During the spring and summer seasons of 1944, the only year of the investigation when the quail population over the study area was sufficiently large to warrant concerted nesting studies, a total of sixty-one quail nests was discovered. Many of the nests were located through interviewing farmers, road maintenance crews, utility workers, and others who work was of the outdoor type and whose daily activities were conducted over quail ranges. Some nests were found by the investigators as they combed likely looking cover. However, this method proved to be by far the less desirable, as a great deal of time was spent in painstaking search and the results did not justify the time spent. The interview method produced more nests per unit of time afield than any other procedure.

Some of the nests were discovered after hatching had occurred and the birds had left. Because it was known

ut various predatory animals such as the crow, skunk, raccoon, and others will quickly find and remove exposed eggs, it was evident that only those nests known to be active and located immediately after hatching should be considered in establishing her the figures for completed batches or hatchability.

Of the 61 nests located by all methods during this season, 20, or 79%, were successfully hatched. Forty-one, or 67.21%, of the attempts were unsuccessful. The following table lists the number of nests destroyed and the various agents of destruction:

<i>Number nests</i>	<i>Cause of failure</i>
22	Mechanical mowing operations
5	Predation on adult at nest
4	Egg predation
3	Hand mowing operations (scythe)
2	Reaper and binder
2	Activity of dogs at nest
1	Activity of man at nest
1	Manure Spreader
1	Orchard cultivation (disk)
41	

Man in his various activities was responsible for 30, or 73%, of the 41 failures. The large number destroyed during harvesting operations of one sort or another was largely due to the increasing use of mechanical equipment. It was estimated that about 5% more farmers were using tractors in 1944 than in 1936. When mowing was done by horse-drawn machinery the progress was slower. Often quail were frightened from their nests by the horses which were far enough ahead of the cutter bar to allow the operator sufficient time to raise the blades and leave a strip of undisturbed cover about the nests. Quail often returned to continue incubation at nests thus protected. With tractor drawn equipment, progress was so rapid that the operator was unable to save the nests even if the sitting bird managed to escape the

deadly blades. Many nests were mown over and raked over before the harvester became aware of their presence. Quail were never known to return to nests thus exposed, the contents being quickly located and taken by predators, particularly crows.

Predation accounted for the destruction of nine nests. House cats killed the incubating birds at three nests. This animal presents a serious threat to the quail population in some sections. Almost every farm is inhabited by at least one and often as many as six or more cats. Many of them are semi-wild and are not properly fed or cared for. These animals, especially the females with a growing litter of kittens, roam at will over the countryside, killing what they can. They are tireless, capable hunters, and account for large numbers of game birds and animals as well as song and insectivorous birds.

Skunks broke up two nesting attempts. These cumbersome prowlers are fond of eggs, and will not pass up the contents of a quail nest if they happen to discover one. Fortunately, this predator was not abundant on the study area.

A blacksnake was responsible for the disappearance of every egg from one nest. This constrictor is fond of quail eggs, and when present in large numbers, undoubtedly may be a major threat to nesting bobwhites.

Crows broke up at least one nest. While these black marauders were responsible for the disappearance of eggs from an undetermined number of nests, the actual destruction was attributed to other causes. Crows had little trouble locating nests exposed by harvesting practices. However, chances are that they are able to locate comparatively few nests which are not exposed in one way or another.

Unidentified predators broke up two nests, killing the incubating birds as they sat upon the eggs.

The two nests failures attributed to the activities of dogs about the nests occurred as the birds deserted the eggs after being frightened by the dogs. In neither case did the dogs disturb the eggs nor attempt to catch the adult quail. These dogs were under control of their owners, however, and it is quite possible that stray dogs, of which there was a large number on the study area, were a more serious threat to nesting quail and young rabbits than the observations of the investigators indicated.

Eight nests were found in alfalfa fields during 1944. Every one of these was a failure. This was due to the fact that alfalfa matures early and is sometimes harvested in May before the nesting quail are able to complete egg laying and incubation. All of these nests were lost as a result of harvesting operations.

Eight of the twenty-one nests located in mixed clover and timothy hay fields were successful largely because the birds were able to hatch the eggs before harvest time. Thirteen, or 62%, of all attempts in this type of cover failed.

Of nine located in fallow fields 4, or 44%, were successful. Two or

22%, of the nine located in fence rows were successful. The fence rows were very narrow and supported sparse cover.

Nine nests were found along the edges of roads. Of this number 6, or 66%, were successfully hatched. It appeared that nests located in this type of cover had the best chance of producing young birds.

All the remaining nests, located or each in a barley field, a wheat field, a peach orchard, a country cemetery lot, and in ornamental shrubberies were failures.

### Hatchability

Since it was discovered that predators may visit quail nests after the eggs have hatched and remove unhatched eggs, the hatchability figures for only eleven nests were considered. Other nests were not visited soon enough after hatching, or the exact time of hatching was not known. In the eleven nests considered, 161, or 92.54%, of the total of 174 eggs hatched. Of the thirteen which failed to hatch 9 proved infertile, 2 were pipped, and 2 contained dead embryos in an advanced stage of development. General weather conditions over the study area were near ideal, and the absence of heavy rainfall, prolonged dry or hot spells, freezing temperatures, or hail storms was probably a contributing factor in the high hatchability figures of the nesting season of 1944.

### Development of Chicks

Newly hatched quail chicks leave the nest site as soon as they are dry weather permitting. One group of very young quail was observed being brooded by the parent bird about a foot from the mouth of the nest immediately after hatching.

The distance travelled by young birds is probably not great the first



PGC Photo by Lathan  
Only one-third of the nests produced chicks

*Capped egg shells—the sign of a successful hatch.*

PGC Photo by Studholme



w days of their lives. However, they develop amazingly fast, and can fly short distances when two weeks of age. Both parents assume an equal share in tending to their new offspring, leading them in search of food, brooding them to protect them from the intense rays of summer sun, the wet of rains, or the cold of nights. Young quail, fancying themselves lost, utter a very highpitched shrill call from the day they are born. They soon learn to be quiet, however, on command from the parent bird. They lie motionless in whatever position they can quickly assume when the parent gives the "alarm call." The adult then lies its wiles on the intruder, usually driving it from the vicinity of the chicks. After the danger has passed the adult returns, calls the brood together, and normal activity is resumed.

Newly-hatched quail chicks are covered with a soft natal down. This fuzzy covering is largely chestnut color, the sides of the heads being lighter, and the backs streaked with buffy stripes. This combination of colors admirably suited for camouflage, and a motionless chick is very difficult to find, the shadows and streaks of light in the cover effectively hiding it. At two weeks of age, juvenile plumage is beginning to show on the quail chick. Six weeks later this plumage predominates. Adult feathers and coloration are well established at the end of thirteen weeks, and within two more weeks the young quail resemble the adults very closely.

The abundance of insect life during the growth period of young bobwhites assures them of the high protein diet necessary for normal growth.

#### Juvenile Mortality

During the period of growth from the egg to the mature bird, large num-

bers of quail are known to perish. No practical means of arriving at loss figures during this stage of development were discovered. From observations of hens with abnormally small broods, and from reports of dwindling groups of young, it appeared that the loss was significant. Brood counts were unreliable, as there was no way of knowing whether the group represented one or several hatchings.

The causes of juvenile mortality are probably numerous. Continued rain and cold are known to be lethal to young quail. Accidental death may result when young chicks fall into depressions from which they are unable to extricate themselves. The wide use of poison sprays, particularly on potatoes, may cause death to young quail that eat a sufficient amount of the poisoned insects. Inherent weaknesses in the chicks is probably a large contributing factor. Disease should not be overlooked nor should predation.

#### Food

The variety of food consumed by bobwhites on an annual basis is remarkable. English and Bennett in their examination of 89 quail crops from Pennsylvania in November of 1938 and 1939 found 32 different

items. The five most important foods both years, measured in terms of volume, were lesser ragweed (*Ambrosia artemisiifolia*), corn (*Zea mays*), wheat (*Triticum aestivum*) foxtail grass (*Setaria glauca*), and buckwheat (*Fagopyrum esculentum*). Six items of animal matter were identified during a season of the year when insect life is disappearing rapidly.

During the summer, quail food is generally abundant and readily accessible. It consists principally of insects, berries, fruits, and green vegetation. The high protein content provided by insects is especially valuable to growing birds. A pen-reared quail liberated in April and killed three days later was found to have eaten 52 clover leaf weevils (*Phytonomus sp.*). Wild bobwhites were observed feeding on grasshoppers and potato beetles (*Doryphora decemlineata*). One warm, still June day an adult hen quail was seen feeding along the edge of a country road. She was not alarmed by the observer as he sat in his automobile. Dandelions grew in profusion at this spot, and the hen, being unable to reach them conveniently, was observed to beat the plants with her wings, thus dislodging the seeds which fell to the ground and were consumed in quantity.

Large amounts of food available during snowless winter weather becomes unattainable to quail when snow lies deep on the ground. This is the critical season of northern ranges. It is at this time that food is most needed and most difficult to find. Only those food-bearing plants of sufficient height that they protrude above the snow are of value. Quail were known to feed upon the berries of poison ivy, wild grapes, pokeweed (*Phytolacca decandra*), sumac (*Rhus sp.*), spice bush (*Benzoin aestivale*), corn, when left unhusked or in shocks, and unharvested soybeans. They probably also utilize the fruit of Japanese honeysuckle, greenbrier, and bitter-

sweet (*Celastrus scandens*). Openings in the snow are frequently in winter in search of green food usually to be found there.

### Feeding Habits

Quail ordinarily feed twice a day in the morning and in the evening. Their activities are somewhat governed by the weather however, and on wet, cold mornings they may forego feeding until later in the day. Often before storms they feed more heavily than they do in settled weather.

Limited field observations of feeding quail made it apparent that they fed deliberately and slowly, always on the alert for danger. The amount of wandering done in search of suitable food was proportional to its availability. Under ordinary conditions quail take their food from the ground or from plants low enough to be easily reached. Hopping insects, such as grasshoppers, are eagerly chased. When forced to expose themselves while feeding, as is often the case when snow covers the ground, quail feed quickly and return immediately to secure cover. They seldom venture more than a few yards from a safe retreat. A covey of birds feeding in an unharvested field of soybeans, the tops of which protruded above the snow but offered little protective cover, were observed to move rapidly from plant to plant, gather the beans hurriedly, and retreat to cover. Repeated forays were made in the same manner until their appetites had apparently been sated. Sometimes quail may fly from nearby cover to food. This was observed many times as quail approached isolated shocks of corn in snow covered fields.

The feeding habits as well as the food of this interesting game bird were varied to suit existing conditions. Bobwhite is an extremely adaptable bird and no set of rules can be applied to his behavior either individually or as a group.

### The Fall Covey

The young and adults of one family form the nucleus of the normal fall covey. To this group, from time to time, may be added individuals from other groups. Occasionally other small bands may join the covey ensemble. The newcomers apparently are readily adopted by the covey, and it is not unusual to flush bevvys of quail presenting several different age classifications.

During the fall and winter seasons all members of a covey of quail live together in apparent harmony with one another. They forage for food over the same territory in loosely knit bands; loaf together under the protection of their chosen cover; and rest together in circular formation, their heads toward the outside of the circle and their bodies pressed against each other. The habit of spending nights in this formation enables the birds to keep warmer, as they take advantage of the body heat of their neighbors. It also is of definite value in case the covey has to take suddenly wing to escape some predator, as each bird is free to spring into immediate flight without interfering with the flight of others of the group. Food is generally present in large quantities in the fall. Ripened seeds are plentiful. Some insects are still present. Cultivated crops such as corn and wheat have been harvested, but much waste grain is usually available. In all, the fall is a season of abundance for quail.

It is a season too of increasing danger. The annual southward migration of hawks begins in September and continues through the month of October well into November. Every fall thousands of Sharp-shinned Hawks (*Accipiter velox*) and Cooper's Hawks (*Accipiter cooperi*) follow thermal currents along the north-south ridges which stretch in almost unbroken lines across the study area. There is the question that these wanderers

kill numbers of quail, as they are both known to prey on bobwhite. By accident or design, the very times of day when quail are themselves most active are the times chosen by migrant accipiters to hunt.

The dying and falling of annual plants, the harvesting of farm crops, and the falling of deciduous leaves contribute to the growing scarcity of fall cover. There is evidence of considerable movement by coveys of quail probably seeking secure ranges which they will inhabit during the coming winter. Reports of coveys numbering forty or more individuals were received. These abnormally large groups were thought to be birds moving to more favorable surroundings. Often these were encountered well within heavily wooded areas not usually inhabited by bobwhites. Repeated efforts by the investigators to locate large bands of birds met with complete failure. Apparently they had moved on, and perhaps, finding suitable range, had split up into smaller bevvys.

### Winter

Winter is the most critical season of the year for bobwhite over its northern range. Food scarcity, bitter cold, and snow were often encountered. Seasonal vegetative growth was at a standstill, and cover often was scarce. The cruising range of quail was limited in periods of adverse weather to that amount of territory necessarily traversed in search of the bare necessities of life, cover and food, without which they could not live.

Well meaning sportsmen and farmers undertook to "save" quail by furnishing them with supplementary food supplies during periods of deep snow. The value of this widespread practice as ordinarily conducted was extremely doubtful. Often the food was placed in locations where little escape cover existed. The desperate birds exposed themselves in order to take advantage of the well meant

bounty. Predators, notably Cooper's Hawks, soon found these feeding stations. From then on until the last quail had been killed they proved to be real "booby traps." Wheat, the food generally supplied at these stations, proved to be very poor food for quail, as it lacked many of the essential elements necessary to maintain life. Many quail being fed on wheat alone were known to perish. It was recommended that yellow corn either whole or cracked be substituted for wheat at feeding stations; and that such spots be carefully selected where adequate escape cover was present.

Large numbers of bobwhites, weakened by starvation and exposure, were known to fall victim to predation. The Cooper's Hawk individually was the most important quail predator resident on the study area. This accipiter is a well known "bird hawk." During the winter when the thousands of insectivorous migratory birds which act as important "buffers" during other seasons had left the study area, bobwhites were subjected to severe losses to Cooper's Hawks. Six members of one covey were killed in ten days by one of these persistent predators. A covey of eight birds met its doom at the rate of one bird per day. Another group of twelve quail disappeared gradually. Reports of a "fast flying bluish colored hawk" killing members of different quail coveys were often received during winter.

Foxes, both the red (*Vulpes fulva*) and the grey (*Urocyon cenereoargentatus*), were known to kill quail on the study area. House cats probably took a heavy toll of those coveys which ventured into farm yards in search of food. Predation as a limiting factor in quail populations is dealt with elsewhere in this report. It is sufficient here only to mention it as one of the very real and important dangers which bobwhite faces the year around, but particularly in winter.

Continued cold weather and deep snow are the principal enemies of quail in Pennsylvania. The writer estimated that nearly ninety percent of the quail resident in Fulton County in the fall of 1944 died the succeeding winter, mostly from the effects of severe weather. One farmer reported the disappearance of three coveys which he had been feeding, during late January of 1945. High wind near-zero temperatures, and drifting snow which blocked most country roads, filled shallow gullies and ditches, and piled up in fences characterized this period. Snow had covered the ground in many places since mid-December. The few quail which survived this winter were in locations where cover and food were present in natural form and sufficient supply. They were protected from the rigors of winter by deep ravines, brushy woodlots, mountains which broke the force of the winds, or similar sizeable barriers. They were protected from their natural enemies by escape cover of sufficient height that it did not become snowbound. Japanese honeysuckle was much utilized during this season. A majority of the covey ranges occupied by quail during adverse weather also supported this important cover. The winter of 1944-1945 was admittedly severe. It is used here as an example of the kind of winter bobwhite must experience at least occasionally in Pennsylvania.

### Winter's End

With the advent of the first warm days of spring, male bobwhites probably begin to think about selecting mates for the coming nesting season. Evidence of pairing activities among members of quail coveys prior to the "break up" was uncovered. Groups of quail flushed at this season flew off in pairs, alighted together, and repeated the performance when again disturbed. Seven wild trapped birds, four cocks and three hens, which had occupied the same close quarters

parent harmony became quarrelne in late March. The killing of e of the males by one or more of e other cocks relieved the tension d the group resumed its harmonis demeanor. No further evidence fighting was observed.

Pairs of quail may remain in coveys weeks before they set about select- g nesting sites. One case of nest ilding by a pair of birds, while the veys was still intact, was discovered en a male and a female quail were shed from the mouth of a newly-ilt nest. However, this is probably e, and most couples probably do t build until the bevy has "broken " for the season.

The "break up," which is simply scattering of the pairs as nearly as e sex make-up of the group allows es place when warm weather has finitely established itself. The date

may vary from year to year. It has been reported that quail may re-unite as coveys, after they have once scattered, if cold weather is encountered. This was not observed by the writer, although reports of quail coveys ob-served as late as mid-May were re-ceived, and may have represented re-united groups.

The covey "break-up" in spring completes the year-round history of bobwhite quail as presented herein. Bob and his mate face another year of harassed existence. The writer ardently hopes they make it.

*An abandoned "out-house" was used by one covey as a regular winter roosting site.*

PGC Photo by Latham





NED FMC



### Part III

## PHYSIOLOGICAL AND ECOLOGICAL RESEARCH

This portion of the report presents the actual experiments and investigations upon which the conclusions and recommendations for future bobwhite management have been based. The research work described was designed to prove or disprove the several theories which had been advanced to explain what had happened to the quail in Pennsylvania during the past thirty to forty years. This was the scientific attempt to find out why these game birds had practically disappeared over much of the state and had become exceedingly scarce even in the best quail counties.

### INVESTIGATIONAL PROCEDURE— FIELD STUDY

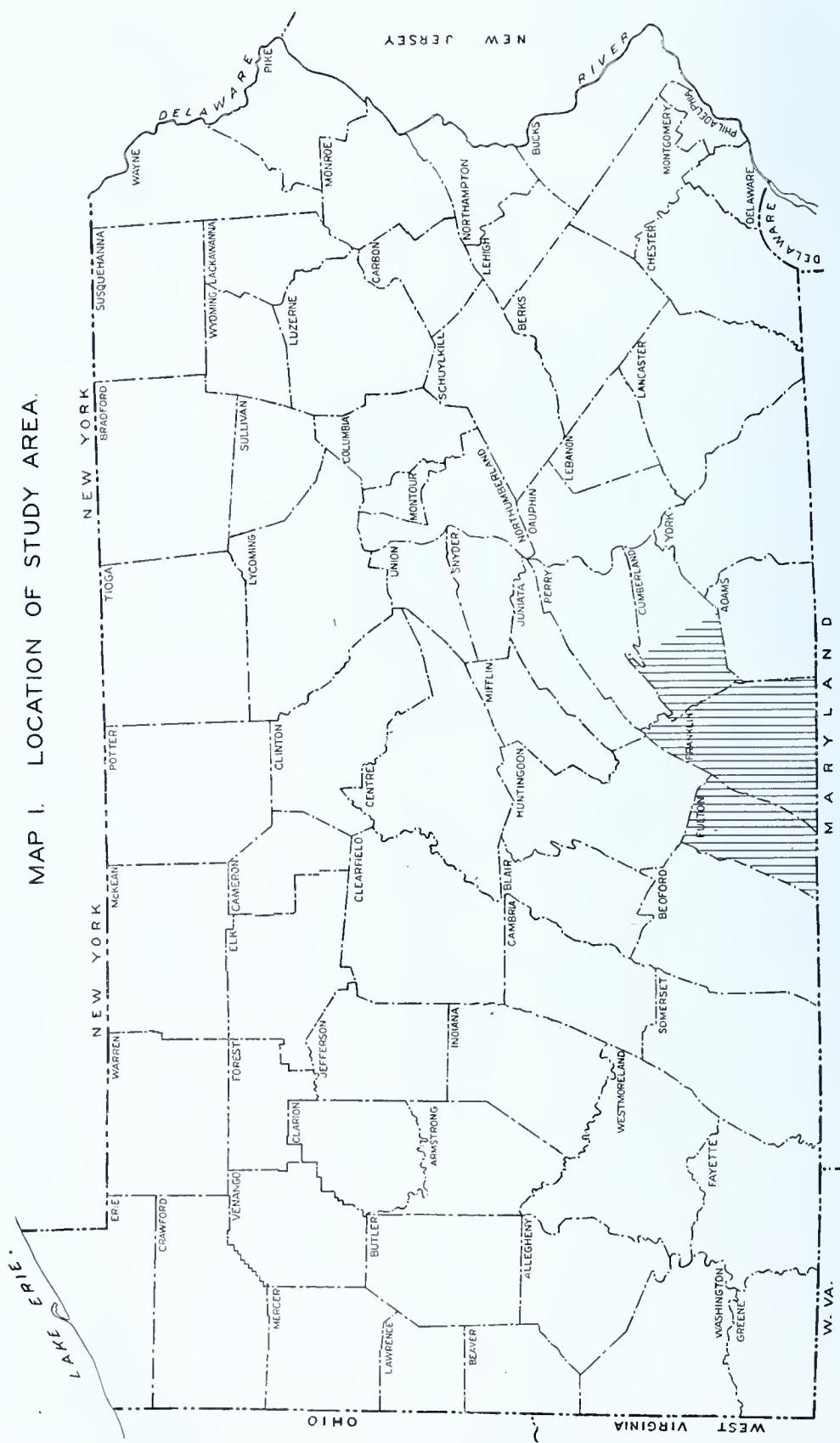
#### The Study Area

The investigations were confined to the counties of Fulton and Franklin in their entirety and the portion of Lycoming County lying west of highway 233 which runs between Bald Eagle Gap and Pine Grove Furnace—a total area of about 800,000 acres, or 1250 square miles. This area is situated in the south-central portion of Pennsylvania lying immediately north of the Maryland line, and is entirely within the Ridge and Valley, or Vallemont, Region. This region is typified by long, narrow, rugged mountains which may extend for one hundred miles, broken only by an occasional narrow gap. The tops are rarely a half mile wide and may be merely a few feet across. All of the mountains and ridges of this region run parallel (roughly north to south), and the valleys between are mostly narrow (one-half

to three miles) except the Cumberland Valley which averages about fifteen miles in width. The elevation of both mountains and valleys varies considerably from east to west with the lower levels to the east. The valley elevations are mostly between 500 and 1,300 feet and the mountain heights between 1,500 and 2,300 feet above sea level. The total forested acreage for the study area is about 190,000 acres, and the total farm acreage is about 590,000 acres. Fulton County has 68,000 acres of forest land and 163,000 acres of farm land.

The climate for the study area, and for the southern half of the state, is considerably milder than that for the northern part of the state. The temperature rarely falls below zero. The average mean temperature for January as recorded at Harrisburg since 1889 is 30.3, and this would closely approximate the January mean for

## MAP I. LOCATION OF STUDY AREA.



ie study area. The average annual mean temperature at Harrisburg was 52.6. The normal annual rainfall is about 38 inches, with a low of 25.52 and a high of 57.07 since 1858. The rainfall at Harrisburg since the inter of 1889-90 has averaged 31.6 inches annually, with a high of 53.1 and a low of 8.8 inches. The growing season averages about 200 days. Most of this meteorological data would be somewhat altered in the western part of the study area where the higher altitude would be likely to shorten the growing season, lower the annual mean temperature, increase the snowfall, etc., but the difference would not be great.

Soil erosion in Fulton County varies from moderate to severe, with the "severe" classification predominating. Such land has been abandoned in this county because its productivity has been so decreased, and most of these "old fields" have grown up to scrub pine (*Pinus virginiana*). The soils of Franklin and Cumberland County (the Cumberland Valley) are mostly limestone in origin with some shale soils nearer the mountains. No detailed description or maps of the soils of these two counties are offered, because so little intensive work was carried out in them. Because the terrain is comparatively flat in the Cumberland Valley, soil erosion is not so pronounced as in Fulton County.

Bobwhites did not appear to favor one soil type over another, unless a greater degree of erosion had occurred upon one. The census of the spring of 1944 when bobwhites were relatively common in Fulton County revealed a nearly equal distribution of coveys over the three major soil types. And after the reduction of the 1944-45 winter, there was still no correlation between soil type and survival. Apparently, the presence of adequate food and cover is more important in determining carrying capacity than soil type.

The range encompassed by the

study area may be divided into four major wildlife habitat classifications (Map 1).

1. *Mountain forest type.* As the name suggests, this division included the vast stretches of nearly unbroken, oak-pine forests which cover the mountains of the region. Because this type of habitat is nearly completely unsuited to the requirements of the bobwhite, its specific composition will not be discussed. This type and the next represent opposite extremes—one where cover is abundant and food is lacking and the other where food is plentiful and cover sparse. All of the 190,000 acres of mountainland lying within the confines of the investigational area offer no acceptable habitat to the bobwhite. The almost impenetrable thickets of scrub oak on the flats of the South Mountain and the slashings and heavy growths of pine on any of the mountains provide excellent cover, but these forests do not produce a sufficient quantity of the right kinds of food to sustain quail during every season of the year. Except for their use as escape cover when adjacent to agricultural land, these mountain forests are seldom frequented by the bobwhite. A few reports of coveys being sighted some distance from any cleared land were received, but these were believed to be quail that were in the midst of a seasonal movement, probably for the purpose of locating in an area where food was more plentiful or competition less pronounced.

2. *Superior farm land type.* This division includes the major portion of the broad Cumberland Valley, but excludes a narrow strip of land bordering the mountains on each side. The only other section falling within this classification is a comparatively small area lying above and below the town of Spring Run in Path Valley in the northwestern part of Franklin County. The composition of the habitat offered by this highly cultivated farm land is nearly completely dis-

MAP 2.  
HABITAT TYPES



Mountain forest type 24%

Superior farm land type 22%

Narrow stripes of Cumberland Valley bordering the Blue, Cove & South Mts. 7%

Narrow valley-ridge type 27%

Habitate types as found in Fulton, Franklin, and western Cumberland counties. Seven-six per cent of the land is potential bobwhite habitat.

imilar to that of the mountain forest type. The terrain is flat, broken only by an occasional slow-running stream whose banks are kept brushed to provide maximum pasturage forairy cattle. The deficiency of cover pon this type of habitat is almost unbelieveable. Much of the land is nearly evoid of woodlots and brushy cover, nd fence rows are almost non-existent. The fields are large, usually tteen to thirty, or more acres in xtent and seldom are any of these eft uncultivated even for one year.

Rarely is there insufficient cover uring the summer and early fall months, but, when viewed in the winter, the average Cumberland Valley farm presents a picture something like this: two or three large fields will be sown in winter wheat (or rye or barley), and usually one or more will ave been plowed in the fall and left o lie in this barren condition over he winter. A good percentage of the creage will be in hay, usually timothy but much clover and alfalfa is

grown, and this will have been cut within two or three inches of the ground. All corn is cut and hauled to the barn for dairy feed, and the stubble disked and sown to winter wheat. If a corn stubble is permitted to stand over the winter, it offers practically nothing to wildlife because most of these fields are nearly weedless. All of the poorer land, including the scattered woodlots, is pastured, and this practice eliminates most of the usable herbaceous or grassy cover. The cereal grain stubbles complete the picture. These are exceedingly short, and are, like the corn stubbles, nearly weedless. The valuable intermixture of ragweed and other seed-producing plants is seldom of such density as to be of much value either as food or cover. A recent addition to the "clean farming" practices is that of mowing the grain stubbles in late fall before the ragweed matures. The only remaining possible source of natural protection, the fence row, is completely lacking. The fields are

*The deficiency of winter cover is almost unbelievable.*

PGC Photo by Latham



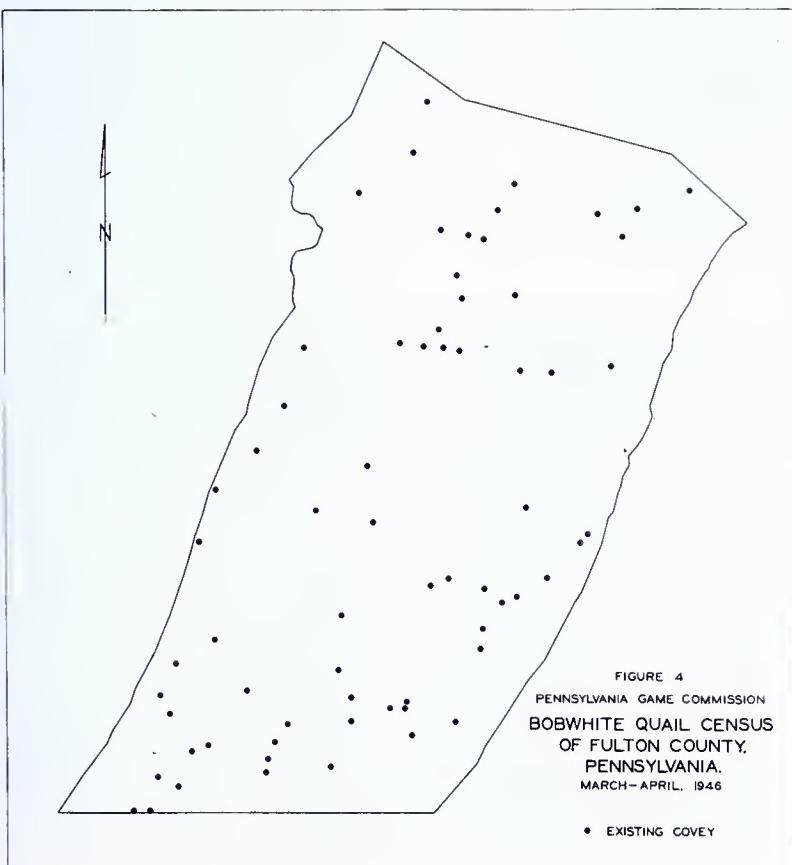
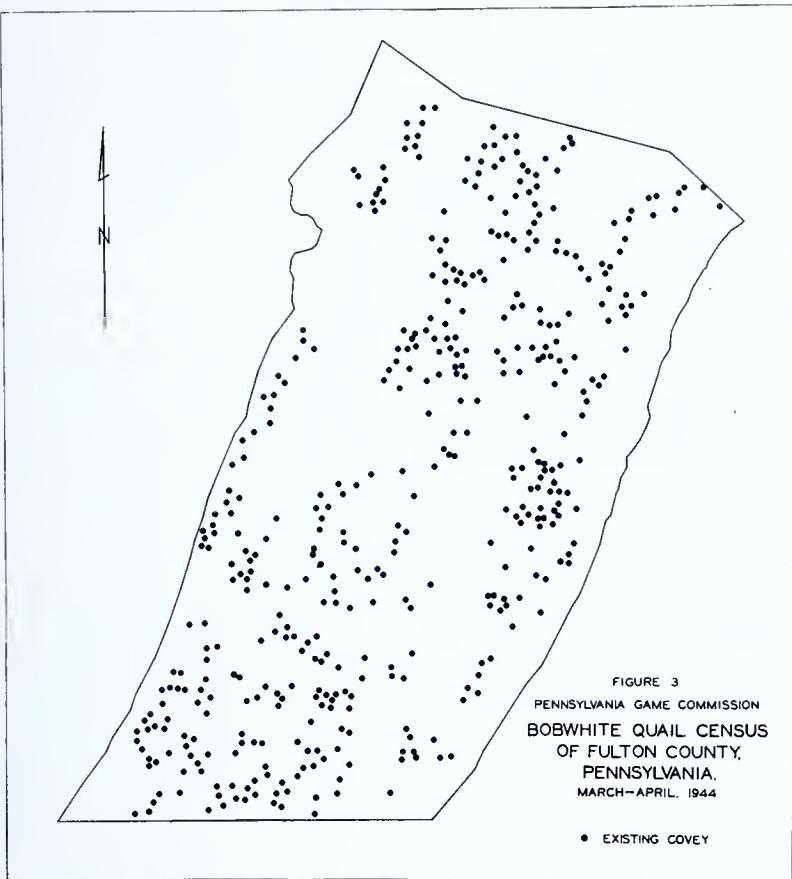
separated by a three-strand barbed wire fence and about two feet of sod, nothing else. Thus, the prevailing agricultural practices have eliminated a great percentage of the natural cover on this land, and, consequently, much of it has become uninhabitable for game. This extreme paucity of cover has even had the effect of reducing the mouse population to a sub-normal level.

To illustrate the unproductivity of these highly-cultivated farms, the game bird kill for 1943 in the Cumberland Valley has been computed upon an unit per acre basis. The game kill figures used in this computation are those estimated by the two Game Protectors in charge of the districts. It is admitted that estimations may be incorrect, but, in this case, the estimation is believed to represent the *maximum kill*. Only 1,175 ringneck pheasants, bobwhite quail and Hungarian partridges were killed on the 355,000 acres of the Cumberland Valley lying within the two districts, or a unit-per acre figure of one game bird for each 302 acres. To aggravate further the situation, this kill figure is believed to represent an unusually high percentage of the total bird population—perhaps as much as 65 to 75 per cent, and this includes both sexes of pheasants.

Although food is not abundant, it would be sufficient to maintain game populations of far greater magnitude than are resident upon the area at present. The real short-coming of this habitat type is believed to be the lack of cover which exposes the birds and rabbits to constant predation during the late fall, winter, and early spring. Not only that, but this paucity of natural protection tends to concentrate the game upon the few acres that are blessed with any amount of herbaceous or woody growth, and the hunters are able to take a greater toll than would be possible if the game were more widely dispersed.

3. *The narrow valley-ridge type.* With the exception of the mountain land, all of Fulton County is included within this classification. The valleys lying west of the Blue and Cove Mountains in Franklin County—Little Cove in the southwestern corner and Amberson and part of Path Valley in the northwestern part—are also a part of this third type of environment. Here a great percentage of the farm land is classed as below average to submarginal. This means that fields are small, fence rows are permitted to grow, the land is cut up by numerous small gullies which usually provide good cover, and many of the fields lie fallow and eventually grow up in pines. Cover is generally abundant. Large timber, brush, pine fields dense herbaceous growth, wide fence rows, and weedy grain fields, interspersed in good proportion over most of the land, combine to make this good quail habitat.

4. *Narrow strips of the Cumberland Valley bordering the Blue, Cove, and South Mountains.* This type includes the land lying within one-quarter to three-quarters of a mile from the base of the mountains in both Franklin and Cumberland Counties. In general, this land is of poorer quality than that of the remainder of the valley, and, in most places, takes the form of giant, irregular serrations—the fields often extending well into the base of the mountain, and the forest, in turn, projecting for some distance into the Valley. This intermixture of woodland and cleared land, plus a number of small mountain ravines that afford additional cover before flattening onto the valley floor, provides habitat acceptable to the bobwhite, but cannot equal type three in the numbers of quail per square mile that it will support. The advantage of additional cover because of its proximity to the mountains is partially nullified by the greater concentration of predators and near this mountain land.



### Census Techniques

Many and varied census methods have been used in an effort to obtain accurate counts of resident bobwhite populations, to ascertain the degree of population fluctuation from year to year or season to season, or to determine the comparative abundance of quail upon two or more study areas. Among those evolved are live trapping and banding, tracking, roost counts, "bobwhite" calls, daybreak whistling, spot-checking with bird dogs, and acre-by-acre censuses with bird dogs.

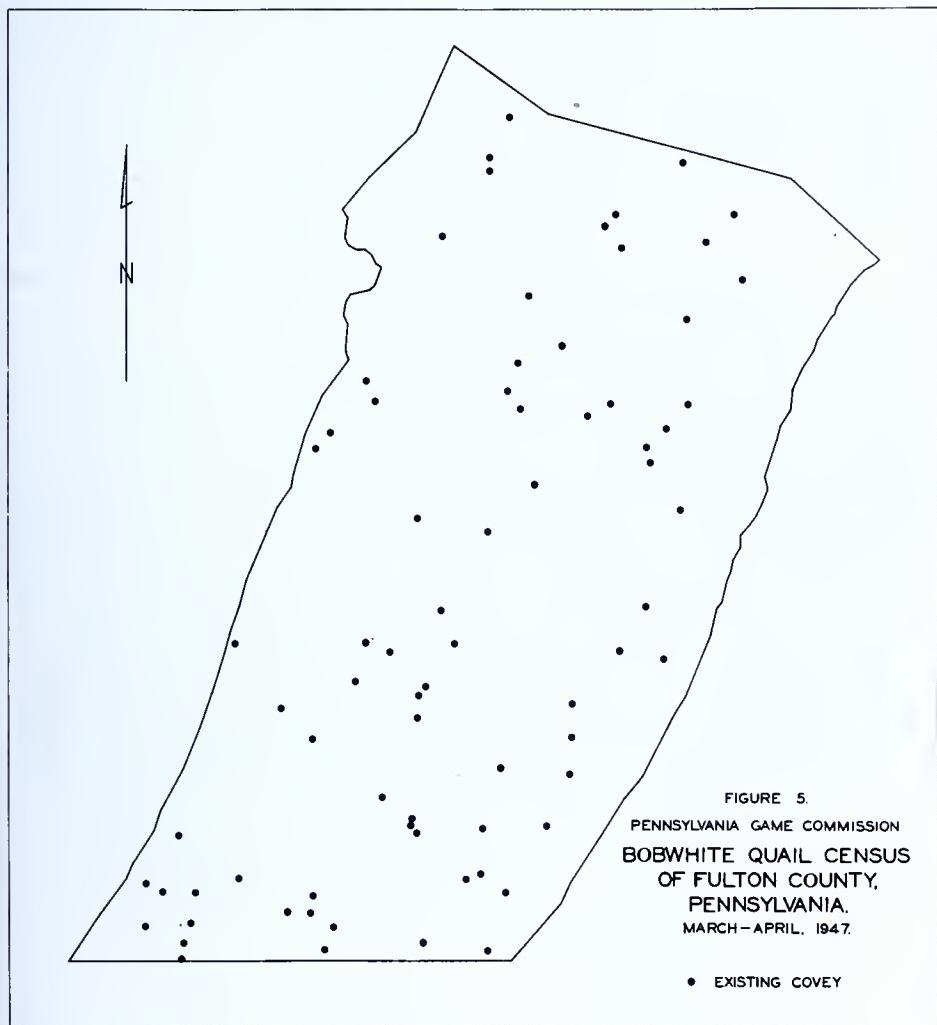
Early in the investigation, the futility of attempting to solve the myriad problems presented by the study by intensive research on small areas was recognized. In order to determine the value or worthlessness of artificial plantings, to ascertain the comparative success of hybrid versus nonhybrid stock, and to acquire accurate figures showing the annual increase or decrease of total populations, it was realized that the census should encompass a much larger area than that ordinarily used for life history or management studies. For these reasons, an entire county, with a total area of over 400 square miles, was chosen as a single study unit, and was censused thoroughly and completely each year.

In many parts of the bobwhite quail range, it likely would be impossible to obtain population figures in the same manner as they were in southcentral Pennsylvania. Fulton County is composed of many small farms, which, for the most part, are operated by individuals vitally interested in the welfare of the bobwhite, and who are with few exceptions admirably cognizant of the numbers of quail frequenting their lands at any season of the year. Thus, the Fulton County census took the form of a farm-to-farm canvass, wherein each farmer was questioned concerning the numbers of quail on or near his

property, the survival over winter of the nests found or the broods counted during the breeding season, causes mortality, and other related matters. The results obtained by this method of census were more than satisfactory.

The writers are convinced that the data obtained in this manner were far more accurate than those which would have been acquired on so large an area by any other means than the census mentioned. As many as four, five, or six farmers would often report the same covey of birds, and would agree, usually with negligible differences and often exactly, upon the number of birds in the covey. It is only reasonable to expect that farmers, who live and work on their small acreage day after day and year after year, have the greatest opportunity of a group to observe and learn about wildlife. Only rarely would an individual be interviewed who would attempt to mislead the investigator, and then further questioning would expose the indefiniteness and lack of truth in his statements. Such individuals were readily recognized, and their information was discarded.

Fortunately, very fine, large scale maps of Fulton County were available, which designated all rural dwellings as small, square markings. This simplified the census work, because all homes could be located even though not visible from the roads, and each could be checked on the map at the completion of the interview. In this manner, 850 farmers were contacted, and the aggregate area of their lands censused, in about five or six weeks time beginning about March 1. This time of year was chosen for the census, because the most difficult part of the winter had passed and mortality from inclement weather was not likely to be important from that time forward; because the census, for best results, had to be completed before the birds paired in April; and because at this



me the population reaches its low-point of the year—the breeding population of the coming season. Figures 3, 4, 5 present the census maps for each year (1944 to 1947).

#### Banding

Banding as a source of information failed miserably during the three and one-half years of the Quail Study partly because very few quail survived until hunting season, and partly because of the non-cooperation of some of the persons coming into possession of bands. Of 3,657 banded bobwhites released upon the three-county study area during this time,

only 23 returns were ever received, and 8 of these were from birds killed by the investigators. Of the 15 returns from other persons, the information concerning two was communicated voluntarily directly to the investigators and one band was sent to Harrisburg as per the instructions on the band. This quail was shot by a non-resident hunter from Maryland. Of the remainder, it was necessary for the investigators to contact the persons and ask to see the bands if and when information was received in a roundabout fashion that unreturned bands were in someone's possession.

A compilation of the band returns

showed the following causes of mortality:

15	shot in season
1	shot out of season
1	hit by car
1	caught in trap
1	found dead shortly after release
1	housecat
2	hawks
1	unknown

—  
23

The total band return was 0.063 per cent, and the legal kill in hunting season was 0.041 per cent.

The bird shot out of season was killed almost a year after release by a boy with a .22 rifle. This quail was exceedingly tame even after this long period and had been seen perching on window sills of houses for several days. Of the two killed by hawks, one was taken by a Cooper's Hawk at the time of release, and "a big brown hawk" dropped another when frightened by a small boy who picked up the quail and carried it home. The trapped bird was caught in a muskrat set in shallow water. The greatest movement recorded from any band return was about three miles. The remainder had moved from one-quarter to one mile, and many had stayed on the same farm where released.

Just as a check on the observational powers and the interest of hunters and people in general, thirty of the banded bobwhites which had died on the comparison experiments were distributed over parts of the three counties of the study area. Some were placed in the middle of main highways, others dropped on dirt roads, and some placed along the highways at the edge of towns where people

customarily walk. Still others were put on the ground beside rural mail boxes and at the intersection of rural roads with paved highways where all cars are required by law to come to a full stop. All were placed where at least several people were likely to see them, and others certainly must have been seen by hundreds of persons. A very few were placed upon roads almost directly in front of homes of prominent sportsmen. In all cases, it was made to appear that the bird had been killed by automobile traffic. *From the thirty quail, only two bands were returned, both from Franklin County.* One rural mail carrier in Fulton County reported seeing three of these birds on his route, but had not stopped to inspect any of them, even though his curiosity was well aroused.

During 1939 and 1940, prior to the inception of the Quail Study, 1,400 banded quail were released in Fulton and Franklin Counties. From these 1,400, three returns (0.0214 per cent) were received—all within a short time after release. Two of these had been killed on the highways, but the cause of mortality was unknown for the third. No returns were received from the hunting season.

During 1937, 12,420 bobwhites were released over the entire state. Of these, 3,616 were spring-stocked birds of which only two bands were ever recovered for a kill percentage of 0.05. From the 8,804 quail released in September, 74 band returns, mostly "kills" during the November hunting season, were recorded at the Harrisburg office for a percentage of 0.8. The per cent return for the entire release of 12,420 bobwhites was 0.6.

#### INVESTIGATIONAL PROCEDURE— LABORATORY EXPERIMENTS

Controlled laboratory experiments were conducted in an effort to solve five major problems.

1. *The existence or non-existence of a degeneration of the native bobwhite*

*through hybridization with imported or pen-reared quail of inferior quality.* A comparison was made between Pennsylvania pen-reared, Pennsylvania wild-trapped, West Virginia wil-

pped, and Missouri wild-trapped. The out-of-state quail represented non-hybrid stock and the wild-trapped Pennsylvania birds hybrid stock. The game farm birds were included to show their probable unfitness to survive an environment as rigorous as that common to Pennsylvania. All birds were held in identical pens. The total survival times were used as the basis for comparing the three types.

### *2. The effects of fasting and exposure upon subsequent reproduction.*

It was believed that the hardships suffered by quail during severe winters markedly curtailed the successful reproduction of the following one or two breeding seasons. Groups of birds were fasted periodically over two winters, duplicating as nearly as possible the vicissitudes of severe winters, and their reproduction of the following spring and summer was compared with that for non-fasted groups. In order to determine whether the sex was affected more than the other, both groups were cross-mated, so that the experimental females were mated with normal males, and all tested males were mated with normal males.

### *3. The value of different kinds and different levels of various nutrients in the diet for resistance to cold and periods of food shortages.*

The food constituents receiving most attention

were protein, fat, and vitamin A. During the coldest part of winter, the various experimental groups of bobwhites were placed upon a restricted diet (12 grams per bird per day), and the comparative resistance to cold and comparative weight loss measured for each diet. Body weights and body temperatures were taken regularly, and these figures formed the basis for comparison.

*4. The importance of cold temperatures alone in winter mortality (without snow and the resultant food shortages).* Three 8 x 10 pens were placed side by side with twelve quail in each. All were fed the same ration and as much as they would eat. The birds in pen 1 had no protection from wind, cold temperatures, or precipitation. Pen 2 had no protection from wind and cold but was provided with a roof. Pen 3 was provided with an abundance of evergreen branches, corn fodder, straw, etc. which protected the occupants from nearly all climatic adversities. The final results were computed upon a basis of weight gained or lost, body temperatures, food consumed, and mortality or lack of it.

*5. Differential ability of the sexes to withstand fasting and climatic extremes.* Fasting bobwhites were exposed to low temperatures and winds, high temperatures, and mild temperatures, and the survival times for the cocks and hens compared.

## FINDINGS—

### FACTORS CONTRIBUTING TO POPULATION DECLINE

#### INTRINSIC ASPECTS

##### Pollution

As stated in the introduction, the comparatively sudden retrogression of the bobwhite quail in Pennsylvania in recent years can only be attributed to some change—a change within the bird itself or in its environment. This portion of the report will

deal with the possible changes which could have occurred within the bird—physiological, pathological, and psychological. The most plausible explanation for any transformation which has taken place within the native bobwhite is that a pollution, or degeneration, has resulted from

the association and hybridization of the native stock with the nearly one-half million bobwhites introduced since 1906.

The total number of quail stocked may seem fairly insignificant compared to the much larger numbers of native quail which were resident to the state during these years, and the question may arise as to whether a significant degree of hybridization could have occurred. But, it should be remembered that following severe winters the breeding population would be drastically reduced, and during these periods the natural tendency was to release even greater numbers than usual to aid recovery. Thus, it is completely conceivable that the annual stocking of several thousand Mexican or pen-reared quail could cause a gradual alteration in the inheritance of the native stock. No one can doubt the possibility of the communication of disease to native quail, particularly when disease is regularly or periodically common to nearly any game farm.

This association and hybridization with imported bobwhites believed to be unsuited to the rigorous climate of Pennsylvania and artificially propagated birds could have resulted in one or more of the following changes in the native stock: (1) a lessened ability to withstand periods of food shortage and exposure to low environmental temperatures in winter, (2) a deterioration of the instincts of self-preservation—decreased ability to elude its natural enemies, (3) a possible unbalanced sex ratio, and (4) a prevalence of introduced diseases and parasites. It is an opinion, that the inability to survive periods of severe weather and food shortages has contributed more to the downfall of the species than any of the other three possibilities, and considerable evidence has been accumulated in support of this particular aspect of pollution. Few facts can be presented

in proof of the pathological and psychological concepts. A discussion of the four possible forms of pollution follows.

*Physiological—lowering of the resistance to cold and hunger.*

Early releases in Pennsylvania were entirely wild-trapped bobwhites imported from southern states and Mexico. As early as 1906, 4,000 were bought from Alabama. From 1915 to 1931 over 90,000 were received from northern Mexico. Beginning with 1932 and the establishment of game farms in the state, the subsequent releases were entirely of pen-reared stock, some of which was purchased from private breeders.

Nestler in his recent work on the vitamin A requirements of quail weighed the livers from wild bird received from Pennsylvania south to Florida. *There was an almost perfect gradient of liver size from North to South.* The liver weights in grams are given below:

TABLE 1.—Variations in weights of bobwhite livers from north to south.

State	Wt. in gram
Pennsylvania .....	4.3
Maryland .....	3.5
Virginia .....	3.4
South Carolina .....	2.4
Alabama .....	2.8
Southern Florida .....	1.5

It is possible that the importation of 90,000 quail from Mexico by the Game Commission, and the many thousands more brought in by private individuals, may have materially affected the vitamin A storage capacity of our native stock through cross mating. And what about the liver storage capacity of our pen-reared birds? Twenty pen-reared quail from the Eastern Game Farm and six fall released birds of the same stock shot in January were sent to Mr. Nestler for measurement. The findings are given in Table 2.



SCS Photo

*Multiflora Rose*, the ideal "living fence" and an excellent cover plant for small game.

TABLE 2. Liver Weights and Vitamin A Storage of Game Farm Quail

Source	Bird weight (grams)	Liver weight (grams)	Vit. A per gram liver	Total Vit. A (I. U.)
Eastern Game Farm (direct) range av.	160-207 178	2.6-5.1 3.7	134-1161 554	913-3599 1930
Eastern Game Farm (4 months after release) "	185-219 194	2.4-4.4 3.2	333-1314 896	1299-4073 2700

Proof that a physiological change has occurred within the native stock in relation to its ability to withstand exposure and fasting was established through laboratory experimentation, field research, a comparison of game-release and game-kill figures for the past 32 years, the lesser degree of winter mortality and quicker recovery from winter losses prior to the "pollution era," and the non-existence of these conditions at present in other northern states wherein no pen-reared or imported quail have been stocked.

*Laboratory experimentation—a comparison of the ability of non-hybrid wild quail, hybrid wild quail, and pen-reared quail to withstand fasting and climatic extremes.* During the winter of 1946-47, the Conservation Departments of Missouri and West Virginia trapped and shipped a number of native quail to Pennsylvania for this comparative test. The bobwhites from both states were believed to be typical, hardy, non-polluted northern stock. The West Virginia birds were trapped in Nicholas County, situated in the center of the state, at about 2,000 feet elevation. These "highland" birds are noted for their large size and vitality. The Missouri quail were caught in the southern half of the state. Attempts were made to secure birds from other states even farther north, but they proved unsuccessful. It is assumed that quail from the extreme northern portion of the range would possess even greater powers of resistance than those from more intermediate states.

Wild quail, trapped at about the same time in Pennsylvania, represented the hybrid between the native bobwhite and the imported and pen-reared varieties—the polluted stock. A third group was composed of artificially reared bobwhites from the Pennsylvania state quail farm. The quail from the other states were not secured in time to complete the research during the cold part of the winter, because it was necessary to hold all birds for some time to permit them to recover from the weight loss suffered during trapping and shipping and to become accustomed to the unfamiliar food. Consequentially it was not until March 30 that the comparison was begun.

Because only 7 of the West Virginia birds were in good physical condition (the remainder had serious scaly wounds as a result of their extreme wildness and repeated attempts to escape during shipment and while being held in wire-topped pens), the number was used as an arbitrary covey size for the experiment. A larger number of Missouri birds had been received, and a greater percentage were in good condition, so two groups of 12 each and one group of 7 were used. Only 12 wild Pennsylvania quail had been trapped, and these were maintained as a group. From a shipment of 30 pen-reared bobwhites, 19 of the largest, healthiest birds were selected to form a group of 12 and one of 7. All groups were placed in identical, wire-floored outdoor pens with adequate protection from wind, and were given water b-

to food. All but a final few were permitted to die. These few were saved to find out whether quail, some of which had lost better than fifty percent of their starting weight, were capable of recovering from a systemic shock of such magnitude. Most of these birds saved would have died within a day, with one or two possible exceptions. One Missouri male still weighed 128 grams at the end of the 8½ days of complete fast, and, since the average dying weight of this group was 82.4 grams, it was presumed that this bird would have lived two days more, perhaps longer. As a comparison of hardiness, it is interesting to note that on a similar fasting test at the Loyalsock Experiment Station (Gerstell 1942) ringnecked pheasants survived 35 days of complete fast, recovered, and produced eggs of normal quality and in normal numbers during the following spring and summer.

The procedure and findings of this experiment were carefully searched for possible errors or discrepancies, and these are listed below:

**Numbers.** Although a total of 69 birds were used in the test, a more conclusive result could have been attained had there been even greater numbers, particularly of certain groups. Perhaps the average livability of the West Virginia quail would have been lengthened had there been a covey of twelve birds instead of just seven. Also, a greater number of wild-trapped Pennsylvania birds would have been advantageous. However, because the survival times per group were so uniformly even, it is believed that the final results are reasonably accurate for each type.

**Weights.** All of the experimental birds, except the seven West Virginia quail, were believed to be somewhat under their normal weight at the beginning of the experiment. Wild-trapped quail, unless held for a long period of time, are likely to remain



PGC Photo by Latham

*One Missouri male still weighed 128 grams after 8½ days of complete fast.*

under weight because of their nervous temperament and maladjustment to confinement. The wild Pennsylvania quail, at the beginning of the test, averaged nine grams under their weight at the time of trapping—twenty-eight days before. The game-farm birds were not weighed before shipment, nor upon arrival, but they were held in similar pens and upon exactly the same feed as used at the game farm. In spite of the similarity of conditions, it is believed that they were somewhat under weight at the inception of the experiment, and that is why only nineteen of the largest and healthiest of the thirty were utilized. *In all groups, there was a satisfactory intergradation—that is, some in any group were lighter and heavier than some in any other group.* And, the survival times of birds of equal weights in all groups followed closely the average survival times for the whole lot. On the average, heavier birds lived longer than lighter birds of the same type, but there were many exceptions to this rule. Also, light quail of superior groups far outlive heavier birds of inferior groups.

*Environmental temperatures.* The experiment as originally planned was to include both the adversities of fasting and exposure. But, because the experimental birds were not acclimated until late, the test was begun after the cold part of the winter had passed. There is no doubt that, had the environmental temperatures been lower, the survival times for any

group would have been considerably less, and perhaps the differences even greater. The extremes of temperature during the eight plus days of the test were a minimum of 28° and a maximum of 73° F.

The survival times and percentage of weight loss for each group is given in Table 3.

TABLE 3. The Comparative Ability of Bobwhite Quail of Different Types to Resist Fasting.

Type	covey 7	covey 12	Av. hours of survival av. total	Av. % wt. loss
Pen-reared quail	109.9	112.0	111.2	39.4
Wild-trapped Pa.		168.8	168.8	47.3
Wild-trapped W. Va.	178.6	196.3	178.6	52.7
Wild-trapped Mo.	160.1	195.1	187.6	52.9



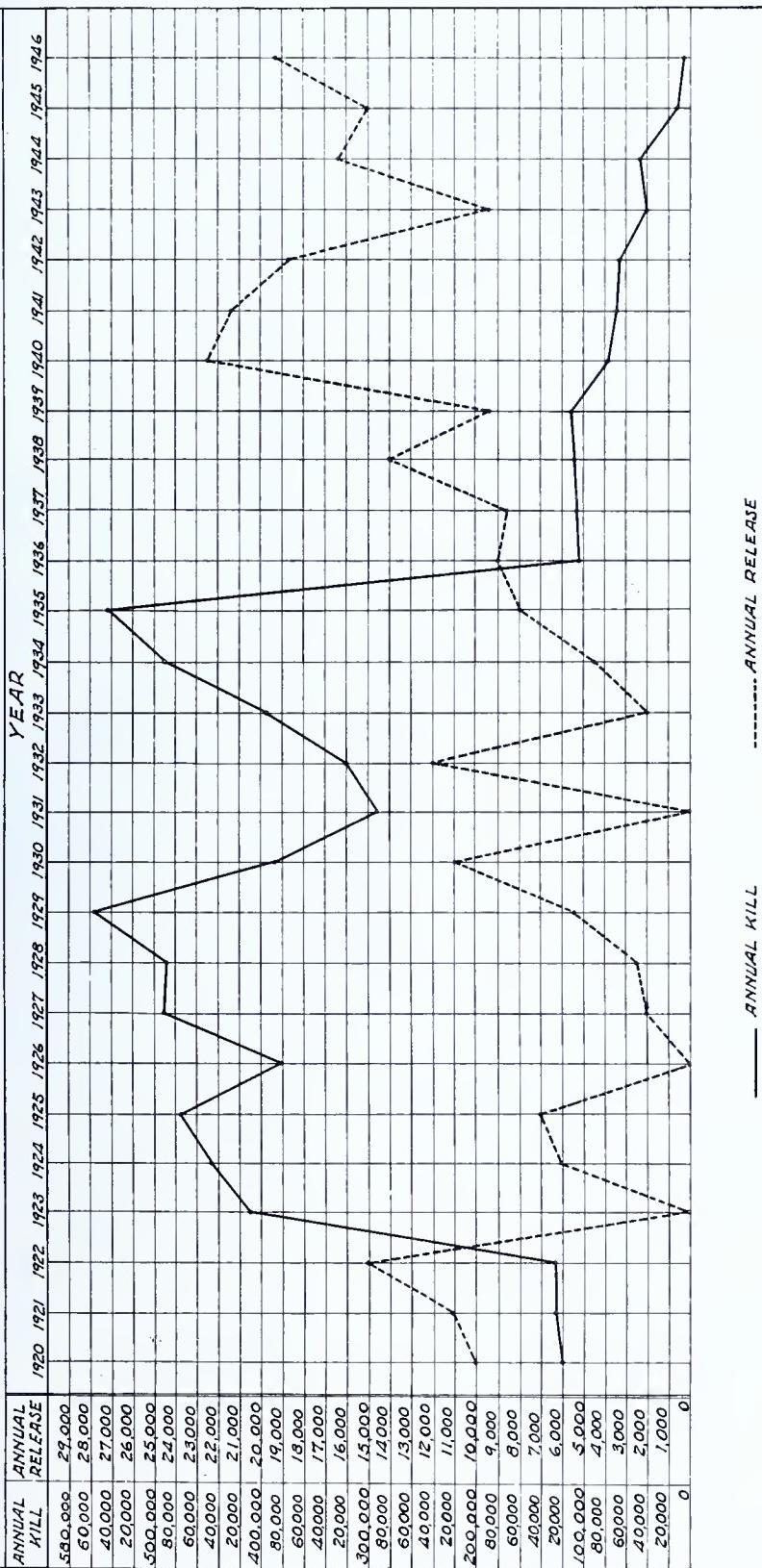
PGC Photo by Latham

*The weight loss exceeded fifty per cent in the hardest groups.*

PENNSYLVANIA GAME COMMISSION

FIGURE I.

THE RELATIONSHIP BETWEEN ANNUAL KILL AND ANNUAL RELEASE  
OF BOBWHITE QUAIL IN PENNSYLVANIA — 1920-1946.



The gradient of resistance followed closely the predictions of the "pollution theory." The marked difference between the pen-reared group and the out-of-state wild-trapped birds certainly reveals the inferior quality of those formerly produced for restocking purposes. The findings of this experiment probably explain the inability of these game farm quail to survive Pennsylvania winters.

*Field experimentation—a comparison of the productivity and livability of artificially propagated quail and native quail in the wild.* This experiment is described in detail in Part IV—Management—under the title: "The impracticality of restocking with artificially reared quail." An area of about 400 square miles was divided into three units; 1,000 pen-reared bobwhites were released upon the first unit in the spring; 1,000 more were released upon the third unit in the fall; and no birds were added to the second or middle division. A census immediately before the spring release, and another exactly one year later, showed that all of the spring birds had been lost, and that better than ninety per cent of the fall release had succumbed by spring. In both of these two divisions and in the middle unstocked division, the original native population maintained or slightly increased itself. These findings in the field support the evidence gained from the laboratory experimentation, and further indicate the poor quality of the game-farm bird as contrasted to the native bobwhite. However, the fact that there was no appreciable increase of the native population during a year which appeared to be normal in most respects would suggest that this stock has also undergone some degeneration through past reproductive associations with game-farm quail.

*Comparison of game-release figures with the game-kill figures since 1915*

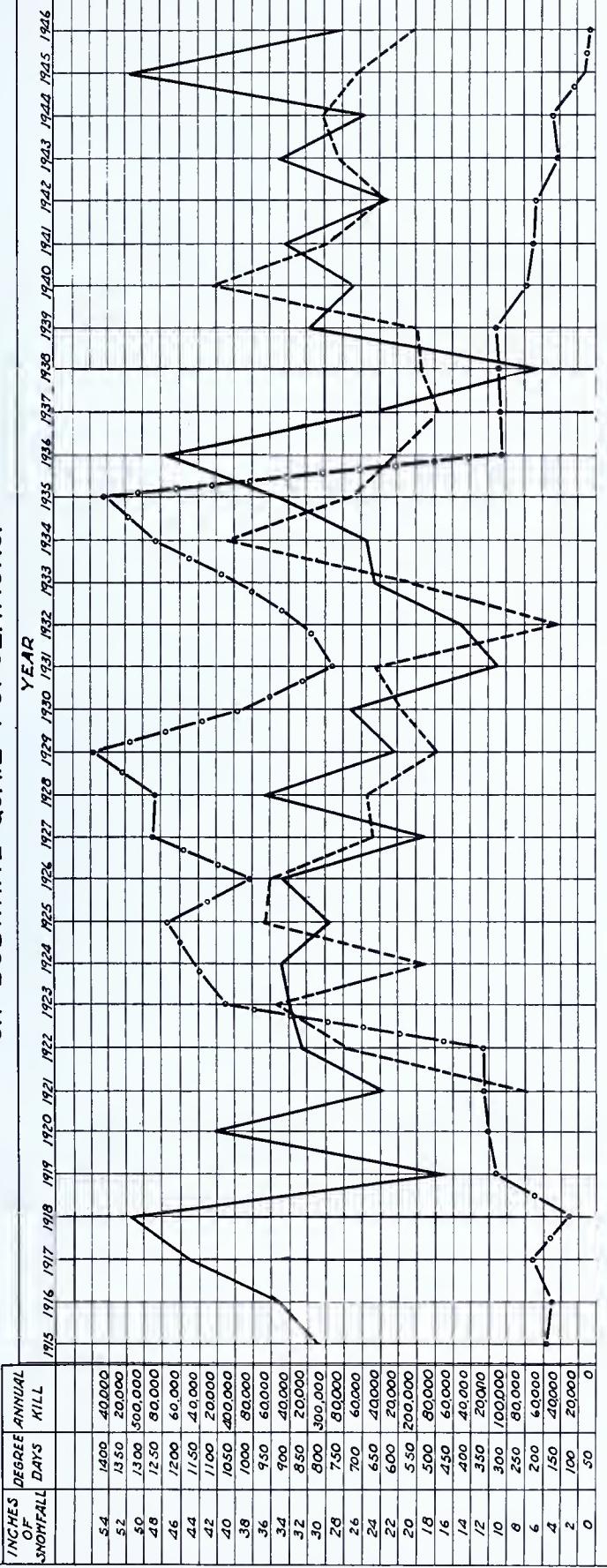
(figure 1). Since the fiscal year of 1915-16, there have been nearly 500,000 imported and pen-reared bobwhites liberated in Pennsylvania. The early releases were composed entirely of importations from Mexico and at least one southern state, but in later years the restocking has been exclusively with birds reared upon game farms, both state and privately owned. Until the disastrous loss of the winter of 1935-36, when fully ninety per cent of the entire population succumbed to the abnormal combination of deep snows and low temperatures, the contaminating effects of these introductions were imperceptible because of the great numerical superiority of the native stock. During most of this twenty-year period, the native breeding birds probably numbered as many as 300,000 to 400,000, or more, each year, while the annual releases for the same period averaged only slightly more than 12,000 birds. Following the ninety per cent reduction and a failure to rebound in the expected two to four year period, the accumulated releases of the next few years, which were unusually large at this time, probably represented a number equal to one-half, or more, of the native quail. The annual kill figure since 1939, with the exception of one year (1944) when there was a very slight rise, has been continuously downward (Figure 1). And, during 1945 and 1946 the total release exceeded the total kill each year. These comparative figures are believed to express the beginning, progression, and effects of pollution and hybridization.

*Extreme winter mortality and extended recovery periods not evident in former years.* Even fifty or a hundred years ago, a certain loss was experienced by bobwhite populations on the northern limits of the range during each winter of unusual severity. Regardless of their frequency of recurrence, it is known that abnormally severe winters have been at least periodically common for the en-

PENNSYLVANIA GAME COMMISSION

FIGURE 2.

EFFECTS OF METEOROLOGICAL INFLUENCES  
ON BOBWHITE QUAIL POPULATIONS.



tire history of the country. The important fact is that, in spite of this intermittent winter loss of considerable magnitude, there were few years when quail were not at least common the next fall. Theoretically, even when three-fourths to nine-tenths of the wintering population perishes, the remaining breeders should, be able to return to the former level within two to four years at the longest. In fact, with optimum environment, nearly full recovery should be attained in one breeding season. This quick recovery was believed to be typical of this "pre-pollution" era, and, of equal importance, the initial winter mortality was believed to be lighter than at present because of a superior hardiness of the bird at that time. In comparison, the recent history of the bobwhite has been typified by regular, extreme winter mortality and an unprecedented slow rate of recovery which has failed, after fifteen years, to reestablish the bird to anything near its abundance in 1935.

Unfortunately, prior to 1915 the records of winter loss and recovery were mostly on a not-too accurate observational basis. However, the severe winter of 1917-18 (Figure 2), serves to illustrate the abnormal loss and quick recovery of the "pre-pollution" era as compared to that of more recent severe winters. Taking the uncorrected game kill figures as a basis, it was apparent that the ill-effects of the winter were only evident for *one year* following the heavy losses, and that by the second year the population had fully recovered and even exceeded its former abundance.

The kill for 1915 was 22,239, for 1916-20,185, and for 1917-26,823. The winter loss reduced the take in 1918 to 11,745, but by 1919 it had jumped to 46,894 and continued to climb for several years. This increase in the kill could be partially attributed to greatly improved highways and a much larger number of hunters after World War I. Careful exami-

nation of the annual reports of the Game Commission back as far as 1902, when the first one was printed, revealed similar losses and quick recoveries.

*Comparison of the history of the bobwhite since 1935 in non-stockin northern states with that for Pennsylvania.* If a pollution, and the resultant deterioration of the stock actually exists in Pennsylvania and the present scarcity of quail within the state can be attributed chiefly to this cause, then a like situation should not be found in northern states wherein few, or no, artificially reared or imported quail have been released.

To ascertain the truth or falsity of this hypothesis, letters were written to the directors of conservation commissions of states lying within the northern part of the bobwhite range. The information requested was a follow-up:

- (1) When were the last imported or artificially reared bobwhites released in your state?
- (2) What was the estimated percentage of mortality during the 1935-36 winter?
- (3) How many years were required for recovery following the 1935-36 loss?
- (4) What was the annual kill, estimated or actual, from 1930 to 1945?

Replies were received from four states, but most of these could not answer one or more of the above questions. However, the information was very enlightening, and pertinent excerpts are given from each.

The reply from the Missouri Conservation Commission substantiates the "pollution theory." The letter will be quoted directly for greater emphasis. It states: "There have been no imported quail stocked by the Conservation Commission since its establishment. A few Mexican quail were released in the early thirties by the old State Game and Fish Department, but very few of these birds apparently survived the first winter after introduction."

"The last year that quail were stocked in Missouri was in the spring



of 1945. Only 1,380 birds were released at this time. These released birds apparently had no effect whatever on the fall population even in the areas where they were released. This has been generally true of all releases of artificially reared birds in this state.

"Our severe mortality occurred during the winter of 1936-37 instead of 1935-36. Since the 1936 population of approximately 3,300,000 birds was already low due to a combination of the 1934 and 1936 droughts and the 1935 wet spring, the 1937 fall population was only about 700,000 birds below the previous year (2,600,000). It would be difficult to estimate the exact percentage which was lost during the winter of 1936-37; however, the population was very low, particularly in the northern half of the state. Even though 1937 was a very good production year for the birds their recovery was phenomenal. Many large coveys turned up in the summer on farms where all the birds were known to have died the winter before.

"The population almost doubled in 1938 with an estimated number of 4,400,000 birds in the fall. In 1939, the third production season following the extreme winter low of 1936-37, our quail population jumped to an all-time high with an estimated population of over 6,800,000 birds.

"The 8,000 artificially reared birds released by the Commission on closed areas in the fall of 1937 apparently played very little part, if any, in a recovery of the birds. The quail were banded and records were secured on what happened to 7,592 of the birds. Of this number only 2,425, or 31 per cent, had survived by December 1 when the first check-up was made. Only 608, or 8 per cent, were recorded as having survived until the following March. Even this survival figure of 608 is high because when the birds joined wild coveys and could not be accurately counted they were

given the benefit of the doubt and listed as 100 per cent survived.

"We have usually estimated that our annual kill for an average year is somewhere in the neighborhood of 2,000,000 birds. It may run much higher than this but we feel our figure of 2,000,000 is conservative."

It is apparent from this information that, in spite of a severe winter loss, a remarkable recovery was made in one breeding season, the population nearly doubled in the second, and an all-time high was reached in the third. Contrast this with the all-time low that has followed twelve successive breeding seasons in Pennsylvania.

The reply from the West Virginia Conservation Commission revealed that this state has been releasing about 8,000 artificially reared bobwhites each year. The situation in West Virginia evidently follows closely that for Pennsylvania because the writer states: "During the winter of 1935-36, we undoubtedly lost a large per cent of our quail population in all but our more southern counties. We are of the opinion that quail populations did not fully recover from the setback until 1940 or 1941, when we apparently had a fairly good population. Beginning in 1942, we have witnessed a gradual drop in our quail population over practically all of West Virginia. In many cases, this drop has apparently amounted to as much as 75 per cent of the population of 1941."

It was thought when the request for information was written that West Virginia did not stock pen-reared bobwhites. But the information contained in the reply would indicate a retrogression in the numbers of quail in recent years similar to that suffered in Pennsylvania, and this recent failure of the species in that state could also be the result of "pollution." In defense of the comparison experiments in which West Virginia bobwhites were used, it should be stated

that these experimental birds were trapped on an isolated range nearly 6,000 feet in elevation and where no pen-reared quail had been stocked. These high-altitude quail have long been noted for their large size and hardiness.

The correspondence from the Iowa Conservation Commission asserted that artificially-reared bobwhites were stocked during the past year, but it was not learned whether this was a regular practice or not, or whether the numbers stocked were large or small. Concerning the recovery from the 1935-36 winter, it states that: "The quail shooting season, which had been opened in 1933 for the first time in seventeen years, was closed during 1936, 1937, and 1938, re-opened in 1940, so it might be assumed that the quail population had recovered from the bad winter at that time." Errington (1941) corroborates this recovery from the 1934-35 and 1935-36 winters by 1939 or 1940. He mentions an "abundance peak" as occurring in 1940.

Bellrose (1940) in his quail studies in Calhoun County, Illinois found a population of about one quail per six acres on 10,619 acres during the winter of 1937-38. He remarks: "Despite heavy nesting losses in mowed areas, Calhoun County had in the fall of 1938, as in the autumn of 1937, a good stand of quail. This is especially remarkable in view of the disastrous winter of 1935-36 which, according to apparently reliable reports, reduced bobwhites to a relatively low population in the locality."

*Pathological.* That diseases and/or parasites may play an important role in the life of the bobwhite is recognized as an ever-present possibility—one which could mean the complete extirpation of the species from the state if some form should assume epidemic proportions. The investigation revealed no positive evidence that diseases or parasites were a primary cause of mortality among quail in the

wild, but this does not prove that such a condition does not exist. Mortality from this source is difficult to trace, and it may be that it should be accredited with a greater share of the responsibility for quail losses, particularly among juveniles. But, a careful analysis of the available evidence would denote that disease is probably of lesser significance as a controlling factor than those of a physiological nature.

*Psychological.* Both the pathological and psychological aspects are merely mentioned as *possible* factors affecting the prosperity of the bobwhite in Pennsylvania. Little evidence can be offered to establish the existence or non-existence of these forms of "pollution" and their influence upon the physical and mental processes of the bird. Psychology, as here used, refers to animal behavior. It was obvious from the field studies that pen-reared quail lack a desirable degree of wildness even after several weeks following release. Is it not possible that a cross-breeding of high quality native bobwhites with semi-tame, domesticated birds might result in a hybrid lacking many of the characteristics so valuable in a truly wild bird? Is it not conceivable that this reverse evolution could produce a bird lacking the innate intelligence necessary to escape predation? If the alertness, wariness, and reflexes—the characteristics best described as "wildness"—of this progeny are reduced or slowed, it is possible that predators and hunters would account for more than the normal loss attributed to them.

#### Effects of Hybridization Upon Sex Ratios

Hybridization has occurred in the wild in Pennsylvania through the importation and cross-mating of the Mexican subspecies *Colinus virginianus texanus*. Also, the large-scale release of many thousands of pen-reared bobwhites, presumably of the same subspecies *Colinus virginianus virginianus* has resulted in further hybrid-

ization. Although the stock may have been identical when propagation began, the second, and subsequent, generations reared in captivity could acquire traits at least as distinct from the original stock as would be likely to be found between subspecies.

Some of the probable harmful effects of this hybridization, or pollution, have been discussed already, but another possibility presents itself. Geneticists have found that this cross-mating of species and subspecies can result in an unbalanced sex ratio of the progeny. When birds are hybridized, an excess of males occur, and when mammalian species are crossed, an excess of females is the result. That an unequal sex ratio does exist, with a preponderance of males, has been commented upon in another portion of this report. Whether this inequality can be attributed to hybridization, or to a difference in the predatory influence, or to the fact that the male is hardier than the female, is not known, but its existence is an established fact.

If following the release of many thousands of game-farm bobwhites, the succeeding generation is characterized by the presence of an abnormal number of males, the reproductive capacity of the species will be greatly impaired and the potential increase considerably reduced.

#### Malnutrition as a Factor in Resistance

Some degree of malnutrition in wild bobwhites can be anticipated during any winter in Pennsylvania. If the winter is open—that is, if the ground is bare most of the time—it is unlikely to be particularly harmful to the birds. However, if food is covered by deep snows for extended periods of time, the malnutrition may become both quantitative and qualitative in form. Partial or complete starvation can result when quail are unable to obtain a sufficient amount of food, regardless of its nutritive properties. On the other hand, mor-

tality may result from malnutrition even when the birds are able to secure all they can or want to eat, if the available food items lack certain essential constituents.

Physiologically speaking, the die and the innate quality of resistance are the two factors which chiefly govern winter survival. Other lesser influences, such as small covey size and lack of protection from rain, snow, sleet, and low temperatures may speed the advent of debility or death, but these are always secondary to the two fundamentals just mentioned. The descriptive term "innate quality of resistance" refers to the inherent capability of a particular bird to survive a substantial weight loss resulting from partial starvation and its capacity for storing essential vitamins, fats, and minerals to sustain life during periods of privation. It is to be inferred from this that nearly all of the evils besetting the bobwhite in winter, apart from the purely mechanical influences—predation, shooting, accident, and perhaps drift or crust imprisonment—are basically the result of dietary deficiencies. During most winters (except those of unusual severity) when the mortality is about normal (perhaps 40 per cent of the number alive on December 1), this loss, if the quail are of sound hardy stock, should be nearly completely of a mechanical nature. But during these comparatively infrequent but disastrous winters when ninety per cent or more of the quail perish, malnutrition, or the effects of malnutrition, may be directly or indirectly responsible for a great proportion of this loss.

A brief discussion of the mechanics involved in the transformation of food materials to energy and heat may help the reader appreciate the importance of the diet to survival in winter.

Foodstuffs are divided into five main groups of constituents—carbohydrates, fats, proteins, vitamins, and

minerals. Carbohydrates are utilized for energy and heat production. Fats serve the same purposes and also form a layer under the skin which has a slightly higher insulating value than an equal thickness of cork. This layer of fat helps to conserve the heat of the body. Proteins can also be synthesized to energy and heat-producing materials, but of greater importance, they are the predominant solid constituents of the organic and muscular tissues. Vitamins are not oxidized as sources of heat or energy, but are necessary for the proper utilization of other foodstuffs within the body, and the proper function of the neuromuscular and cardio-vascular systems. Minerals, like vitamins, are necessary for certain vital processes of the organism, and are the structural material from which the teeth and bones are formed. For growth and health, and to sustain life itself, certain minimum quantities of each of these food groups, with the possible exception of the carbohydrates, must be ingested. If lesser quantities of any one group are consumed, certain abnormalities will appear which may, directly or indirectly, lessen the chances for survival.

Heat and energy are produced by oxidations of food materials in the active protoplasm (muscles and glands) of the body. Of the total energy produced within the body by these oxidative process, only about 20 to 25 per cent can be used for work, and the remainder is transformed into heat which has no other useful purpose except to maintain the temperature of the body. Physiological heat production is measured in calories and Calories. A calorie represents the amount of heat required to raise the temperature of one gram of water one degree C. The large calorie, or Calorie, is one thousand small calories. One gram of fat catabolized (oxidized) within the body yields 9.3 Calories of heat, one gram of carbohydrate yields 4.1 Calories, and one

gram of protein yields 4.1 Calories. The total heat production of the ring dove, averaging 150 grams in weight, was 17 Calories per 24 hours, and that of the tippler pigeon with an average body weight of 263 grams was 26.7 Calories per 24 hours (Riddle, Christman, and Benedict 1930). These measurements were taken during rest at an environmental temperature lying within the zone of thermal neutrality. The zone of thermal neutrality refers to the temperature range within which the requirements for heat production are at a minimum level. This zone averages about 28° C. (72° F.), but varies with the species and the condition of the hair or feathers of the animal.

If we can assume that the quail, which averages about 175 grams, would fall somewhere between the values given above for the ring dove and pigeon, its basal heat production might be near 20 Calories per day. In the winter it would be necessary to add the amount expended for energy and for heat production whenever the environmental temperature fell below the zone of thermal neutrality, so that the daily caloric expenditure would probably lie between 30 and 40 Calories, and possibly reach even higher values during periods of extreme cold. Since the natural diet of the quail probably seldom exceeds four to eight per cent fat, the caloric value of the ingested food (mostly carbohydrate) would probably not exceed five calories per gram. Then it can be seen that during winter a bobwhite must oxidize six to eight grams of food, or tissue, daily to sustain life. When food is unavailable because of deep snows, the bird can be expected to lose weight at this rate until food once more becomes obtainable or until it dies. Since the average quail cannot lose more than one-fourth to one-third of its body weight during cold weather without lethal results, few birds could live more than a week to ten days at the rate of six to eight

grams loss each day, even without the complications of avitaminosis.

Nestler (1946) has shown that the vitamin A content of the diet influences winter survival of adult birds, their reproduction, and the livability of their progeny. ". . . when vitamin A was removed for 4 weeks from the maintenance diet of the first generation of birds, survival was in direct proportion with the quality of the nutrient that had been in the production diet. Only 14 per cent of quail that had been on 2,000 I. U. of vitamin A in the summer survived, in comparison to 92 per cent of those on 8,000 I. U."

"The young stock's survival during the winter, regardless of the level of vitamin A in the maintenance diet, was in direct relationship with the level of vitamin A in the growth diet. When all vitamin A and carotene were eliminated from the winter diet, the average number of days that the birds survived increased in direct proportion with the vitamin A in the growth diet. This variation ranged from only 13 days for those that had received as low as 500 I. U. of vitamin A to 50 days for birds that had received ten times that quantity, or 5,000 I. U."

In the wild, it appears that the ability to store large quantities of vitamin A in the liver is essential for survival during periods of food shortage occasioned by deep snows on the northern part of the bobwhite range. Since it has been found that the liver size and vitamin A storage capacity of southern and penreared bobwhites is likely to fall far below the physiological requirements for winter survival in the north, it is possible that the cross-mating of this stock with native Pennsylvania quail has somewhat reduced the vitamin A storage capacity of the native bird. With the advent of this hybridization and the subsequent weakening of the native bird, deaths from inadequacies of nutrition have become more preva-

lent, even occurring during short periods (one week to ten days) of deep snow or heavy ice. This weakness is believed to explain the slow recovery of native bobwhites following severe winters, because once the wild stock has been severely decimated, the quail surviving subsequent winters, even though they are no particularly rigorous, are so few that recovery becomes a slow, discouraging process.

To emphasize the importance of proper nutrition to winter survival let us follow the course of events which occur during a severe winter when bobwhite mortality may exceed ninety per cent. The birds in our covey under observation are strong healthy individuals at the beginning of winter, because all fall there has been an abundance of insect and vegetable foods. They have been able to deposit considerable fat under the skin and around the visceral organs for insurance against the periods of cold and fasting ahead. A maximum storage of vitamins, particularly vitamin A in the liver, has been accomplished. Our birds, at this season, have attained their maximal degree of vitality for the year, and enter the winter with the utmost vigor and ability for resisting climatic rigors.

Cold days and nights become more and more common, and occasional snows cover the ground for a few days at a time. Food becomes progressively scarce, and the birds are forced to hunt farther and longer for sustenance. Because the caloric value of the food they are able to obtain daily sometimes falls below the caloric requirements for heat and energy, there is a gradual consumption of the fat stores within the body and an attendant loss of weight. The utilization of the tissues is accelerated during mid-winter because the environmental temperature is average still lower and an increased oxidation of food materials is necessary to offset this extra heat loss. And

at that time, deep snows may make much of the natural food unavailable, and the nutritive qualities of the foodstuffs appearing above the snow may be decidedly inferior. It is obvious that all nature is antagonistic toward the bobwhite in winter when the very elements which cause a need for greater amounts of food also cause a forced restriction of the food intake.

By this time our quail may have lost twenty to twenty-five per cent of their body weight and used much of their stores of essential vitamins and minerals. But, the winter is far from over. Another foot of snow falls, food becomes even harder to find, and nights are cold and windy. Now they are growing weak, and lack the strength to forage far for sustenance. They spend much of their time huddled together in the roosting circle, feathers puffed out to entrap a maximum of insulating dead air space, and wait for a thaw, or death. The thaw fails to come, but a near-zero night with a high wind blowing clouds of drifting snow before it does make its appearance. The roosting circle shifts occasionally

as a suffering and desperate bird tries to wedge itself into the tight center of the circle for greater warmth. The drifting snow piles up about them, but few have the strength to stir and trample this imprisoning whiteness beneath their bodies. Two small hens turn to ice where they stand wedged between their companions, and the warmth chain of the circle is broken. The wind whistles and the snow piles still deeper, and finally there is nothing but smooth, unbroken whiteness where only a little while before a round, dark patch on the snow offered mute testimony that life had not yet abandoned the circle of the doomed.

#### Effects of Fasting and Exposure upon Fecundity

During the occasional severe winter when as many as ninety per cent of the total number of bobwhites are lost, what is the physiological effect upon the surviving ten per cent

*Fortunately, the snow did not drift.*

PGC Photo by Latham



which presumably have endured considerable hardship?

After several weeks of deep snows and cold temperatures lasting into late winter, the quail are likely to have suffered pronounced weight losses (25 per cent or more) and be suffering from malnutrition. When snows are deep, the available quantity of food is likely to be reduced below a maintenance level, and those natural foods which are not covered by the snow are not likely to provide sufficient quantities of certain essential nutrients, especially proteins, vitamins, and minerals. Because of the inadequacy of the diet during this emergency period, it is necessary for the birds to utilize much of the nutrients stored within the body for energy, heat production, and other physiological processes. In addition to these nutritional adversities imposed by the deep snows, the birds undergo various physical and physiological reactions to the cold which might conceivably affect their general health and reproductive vigor. Reduced body temperatures and near-freezing must at least contribute to the retardation of the reproductive processes, and may be partially responsible for the suspected reproductive failures following severe winters. Gerstell (1939) has found that the body temperature of individual quail may drop more than 25 degrees F. below normal without the bird suffering a breakdown of its thermal regulatory system. But repeated and prolonged reduction of this magnitude might seriously affect the fecundity of the animal.

Because little is known concerning the effects of exposure to cold temperatures alone upon reproduction, this discussion will be concerned with the possible results of partial starvation plus exposure upon the nesting, egg-laying, hatching, and chick mortality of the season immediately following.

Nestler (1946) states "A deficiency of vitamin A in the diet of breeders affected their own survival, their reproduction, and the survival of their offspring." He found that the vitamin A in the breeders' diet affected the survival of the offspring as long as a year after hatch. A lack of vitamin A in the diet of adult quail was fatal to 93 per cent of all birds within four weeks. Many cannot survive more than ten days to two weeks of vitamin-deficient diets, the longevity depending upon the quantity of this vitamin stored in the liver. If during the middle and latter parts of the winter the ground is covered with deep snows much of the time and the diet is greatly reduced both quantitatively and qualitatively, the quail are nearly sure to suffer from avitaminosis A and a severe mortality may result from this deficiency. The surviving birds, which may be no more than ten per cent of the total fall population, are likely to have depleted most of their stores of vitamin A, much of their fat, and may have been catabolizing some of the muscle protein. It is necessary then, for the breeders to regain most of the lost weight and at least partially replenish their stores of necessary nutrients before they are stimulated to reproduce. But because food is not likely to be abundant in early spring, this recovery is slow and the urge to nest following a severe winter is invariably later than normal. And when nesting actually does begin, the fertility and hatchability of the eggs may be poor and the livability of the chicks almost negligible. Working on this hypothesis, an attempt was made to substantiate the theory both in the field and through laboratory experimentation. *It should be emphasized here that this lessening of the reproductive ability is not necessarily an eventuality common to all bobwhites subjected to these stresses, but, instead is most likely to be manifest only*

*in regions where degeneration of the native stock through hybridization has occurred, or where, for one reason or another the year-round nutrition is inadequate.*

*Observational data.* The two most recent occurrences of severe winter loss were during the winters of 1935-36 and 1944-45. The effects of the first upon fecundity can only be deduced by a comparison of the game kill figures for the years immediately following this catastrophe. The kill for 1936, the first hunting season following the "crash," was 126,285, the next year it was 106,795, and in 1938 it was 109,891. Following the 1944-45 winter, the legal kill started at 12,014 and reduced to 8,244 the next year. Only 8,360 were killed during the 1947 hunting season. The comparative figures for Fulton County during the two years (1945-1946), derived from accurate census counts, showed a similar decrease, or at least a stagnation. In spite of the release of 2,000 pen-reared birds in the county during the spring and fall of 1946, the spring census of 1947 showed only a gain of seven coveys over the like census of the year before. From the census data, it was clear that the native quail had shown no recovery during the year. Contrast this with the effects of an equally severe winter (1917-18) during the "pre-pollution" era. The legal take during 1917, just prior to the heavy snows, was 26,823. This kill dropped to 11,745 the next fall, but, after one breeding season, the figure climbed to 46,894 in 1919 and to 48,000 in 1920.

Errington (1941) summarizes his winter studies of bobwhites as follows: "An eight year (1932-40) field study of central Iowa Bobwhite populations not only began and ended with abundance peaks but also covered an interval of pronounced scarcity. Practically all of the traceable mortality associated with the decline

took place during the winters of 1934-35 and 1935-36 and most of this proved to be of the familiar starvation-emergency types that may be expected on a greater or less scale nearly any winter; *an inexplicably low rate of recovery of Bobwhites among other wild species during the breeding season of 1936, however, may suggest the operation of unknown factors, perhaps of periodic nature*" (Italics by the author.)

*Experimental data.* Thus far, controlled laboratory experiments have been carried out over two winters in an effort to ascertain the effects of fasting and exposure upon the fecundity of captive quail. The experimental birds were subjected to periods of fasting throughout the winter in unsheltered pens in an attempt to simulate as near as possible the hardships suffered in the wild during severe winters. All birds lost much weight during each fasting period, and full recovery was never permitted between fasts. The results showed that egg production was later, the total production period was considerably shortened, the total number of eggs was reduced and fertility was decreased, but no difference was noticed in hatchability. All comparisons were made between fasted "experimentals" and unfasted "controls."

The results of field observation, of the comparison of game kill figures, and of laboratory experimentation would indicate that the reproduction of bobwhite quail is adversely affected for at least two seasons following severe winters.

#### Unequal Sex Ratio

Stoddard (1931) found an unequal sex ratio existing among mature wild quail. With the aid of several co-operators, he secured sex figures for approximately 40,000 quail killed during the hunting seasons in five states. All but 172 of these (shot in Pennsylvania) were taken in the southern states of Florida, Alabama,

North Carolina and South Carolina. His record of 19,423 quail killed in the Thomasville-Tallahassee region showed a variation from 107 to 120 cocks to each 100 hens during five successive years (1924-29). Another table presenting sex ratios for five states (including the 172 Pennsylvania birds) gave a minimum ratio of 113 and a maximum of 138 males for every 100 females of the total of 10,707 bobwhites. Of 845 birds shot on the St. Helena Island Quail Preserve in South Carolina, 478 were cocks and 367 were hens—a ratio of 130:100. Stoddard's live-trapping sex ratios showed even more pronounced inequality than the shooting ratios obtained earlier in the season. The late winter and early-spring trapping resulted in ratios as high as 135 and 137 males to each 100 females. Records of sex ratios by month from fall to late winter demonstrated a greater mortality among the hens during that season of the year, and, consequently, the occurrence of an ever-changing ratio in favor of the males.

Of 12 blizzard killed quail found by Scott (1937), 10 of these were males. This was the remainder of an original covey of 21 bobwhites. His records showed the survival of only one bird following the blizzard, but its sex was not determined. Were the first eight to die females?

Wilson and Vaughn (1944) for their Maryland quail studies state, "Unfortunately accurate sex counts were obtained on only two of the three coveys. In both cases there happened to be two males for every female; covey 7 with 6 males and 3 females, covey 6 with 10 males and 5 females. Covey 20, the only entire covey that was trapped, contained 4 males and 3 females. Males were known to be the top heavy sex in Covey 4. Reasons for this are not known."

Leopold (1933) presents in table form the sex ratios for 4,184 bobwhites from four states over a period

of three years. The average for the total gave a ratio of 111:100, males to females. The ratio for Minnesota which represents the extreme northern limit of the bobwhite range, was 133:100, while that for Illinois slightly favored the females. Records for Mexican bobwhites reveal an unbalanced ratio of 127:100. Leopold explains that a heavier than normal percentage of males may possibly be expected on the edge of the quail range, either north or south, and that states lying within the optimum range, or qualitative center of geographic distribution for the species (Illinois and others), should exhibit a more nearly normal ratio.

Physiological studies (Latham 1947) have revealed the presence of a differential ability of the sexes to withstand temperature extremes and fasting. This fact may have particular significance on the northern part of the bobwhite quail range because there the birds are subjected to periods of severe weather and food scarcity. It is quite possible that the ratio in the North is even more unbalanced than in the South, because of the greater mortality from natural causes, and, consequently, the greater opportunity for the unequal survival of the sexes to manifest itself.

This sex differential has been demonstrated during this and other physiological studies with the bobwhite. Experiments at the Loyalsock Wildlife Experiment Station utilized the climoactometer—a cold chamber in which the various meteorological factors (temperature, light precipitation, wind, and humidity) could be controlled (Gerstell 1942). In the first experiment, 20 quail (10♂ and 10♀) were caged individually and fasted at 0° F., 5 pairs in a 5.8 mph wind and 5 pairs without air movement. Five other pairs were confined as a group and subjected to 0° with no wind. Four pairs of control birds were fasted at a temperature fluctuating between 36-44°

The results showed a composite average of 81.3 hours of survival for the cocks and only 66.0 hours for the hens. The maximum survival for the strongest male was 136 hours compared to 112 hours for the longest-lived female.

Another test was accidental. Twenty pairs of mature quail were inadvertently held in the closed trunk of an automobile for approximately one hour on a hot spring day. The temperature probably reached a point somewhere between 100 and 120° F. beneath the hot metal. When the birds were finally rescued, only 10 remained alive, and *of these were males.*

In preparation for egg production investigations in 1941, 20 pairs of quail were fasted until all had lost approximately 30 per cent of their body weight. During the first week

of complete fast, the males lost 28.7 per cent of their initial weight, and the females suffered a 31.3 per cent reduction. At the beginning, the cocks averaged 187.3 grams, and the hens 185.7 grams.

Hybridization is known to produce an excess of males in the progeny of birds, and the cross-breeding of pen-reared and imported bobwhites with native birds may be creating an abnormal and undesirable ratio of the sexes. It is not known that this actually occurs, but, if it does, the greater number of males born and the better survival of males during winter crises might create a condition detrimental to the species.

#### Degenerate Inbreeding—A Fallacy

It is a common belief among sportsmen of Pennsylvania that inbreeding



can be the direct cause for decreases, either in numbers or in size, of bobwhites, whitetailed deer, cottontail rabbits, and other game animals. They are continually insistent that "What we need is some new blood;" "The birds are bred out," or "The deer are bred out."

In spite of the prevalence of this popular conception, there is no foundation for the inferences of its proponents. Geneticists tell us that, provided the original stock is sound, degenerate inbreeding is impossible. In fact, it is through prolonged and continuous inbreeding that all of our improved pure-bred stocks of plants and animals have been established.

Stoddard (1931) found no evidence of harmful inbreeding during the five years of his Quail Investigation in the southeastern states. He states, "So far as we are aware, it has never been definitely proved that inbreeding alone has ever been responsible for deterioration in any wild race, either of birds or of mammals, nor have laboratory experiments with the closest kind of inbreeding from sound stock through many generations indicated that such a condition is to be expected under natural conditions." Leopold (1931) and (1933) also considers the supposed ills of inbreeding to be non-existent. Errington (1936) summarizes the evidence against the existence of harmful inbreeding as follows:

"(1) Existence of the species in practically unchanged form since at least Pleistocene time;

"(2) The evident correlation of weight averages with geographic distribution, irrespective of shot or unshot localities;

"(3) The continual splitting up and recombination of coveys which occurs incidental to rising population densities, and the movements of individuals for considerable distances in response to seasonal and other natural stimuli;

"(4) The lack of evidence that in-

breeding per se would be detrimental to stock of sound genetic composition even under conditions which may be considerably more favorable to inbreeding than we can conceive of in nature on any important scale.

*The findings of the Quail Study would indicate that inbreeding is the desirable practice, and that hybridization with imported quail of the wrong type and pen-reared quail has been the cause of most of the present management difficulties, not the panacea for them.*

## ENVIRONMENTAL ASPECTS

### Meteorological Influences

It is difficult to evaluate the various climatic factors individually because it is seldom that these adverse influences occur except in combination. That is, we speak of the ill effects of snow and cold; a cold rain, hot, humid days; a wet, cold spring, a cold, windy night, etc.

*Snow.* Of all the climatic forces affecting the bobwhite, snow is believed to exert the greatest hardship (Fig. 2). (1) makes much of the natural food unavailable, and this condition continues over an extended period, the reproduction in the following spring and summer may be greatly reduced, the degree of predation may increase because of physical weakening of the bird, and a moderate to severe mortality from starvation can be expected (as high as 90 per cent during two recent winters in Pennsylvania—1935-36 and 1944-45). (2) Snow covers much of the floral cover and exposes the quail during feeding, resting, and roosting. Thus, predation is intensified. During high winds and drifting, quail are often imprisoned underneath the snow. This, of course, is a "combitnation" influence. *Imprisoned and drifting snow is believed to occur ordinarily only after the birds have already been weakened by extended food shortages.*

ce. The comparative infrequency of ice storms is a blessing for most all game species. Food supplies may be nearly completely cut off for nearly all gallinaceous game birds, even for the bud-feeding ruffed grouse. If the ice persists for more than a few days, bobwhites which have not fed artificially or do not have access to open spring ditches are likely to die of starvation. During the December and early January of the 1945-46 winter, an ice storm followed a moderate snow fall and created a crust on the snow and a coating of ice on all foliage that was nearly impossible for any small bird to penetrate. This icy condition lasted for about ten days, and during that time many quail were lost.

*Low environmental temperatures.* Unless extremely severe and prolonged, low temperatures are not believed to exert a deleterious influence upon bobwhites unless associated with other adversities such as malnutrition, injury, disease, or any other cause of physical weakness. During January, February, and March of 1946, 14 bobwhites (7♂ and 7♀) were held on the ground in each of three 10'x12' pens. In the first, absolutely no protection from the elements was provided. The pen was placed in an open lot where nothing could obstruct the full force

of the wind, rain, snow, etc. The 2"x2" base to which the poultry netting sides were stapled was imbedded in the soil so that there was no windbreak whatsoever. In the second pen, conditions were identical except that the pen had a roof which protected the birds from precipitation, but they were otherwise exposed. In the third pen, everything possible for protection from all meteorological stresses which might be found in the wild was provided. An abundance of evergreen boughs, corn shocks, and weeds made the pen nearly wind-proof, rain-proof, and snow-proof. These quail could undoubtedly keep warm more easily inside this shelter than the exposed birds in the other pens. Yet, in spite of these differences, no pen showed an appreciable loss of weight, and, in fact, the only weight reduction was suffered in the pen with the profusion of good cover (Table 4).

During the sixty-two days of this experiment sub-zero temperatures were only once reached (-1° F.), and the winter generally was not severe. However, the total wind exceeded 100 miles on 16 different days, and the maximum snowfall at any one time was 8.4 inches. Why the covey with the protection cover lost weight is not easily explained. The quail in this pen consumed, on the average, 17.9 grams of feed daily,

TABLE 4.—Value of cover as protection from climatic severities

Date	Pen 1 (no cover)	Pen 2 (with roof)	Pen 3 (maximum cover)
1-22-46	172.2 gms.	175.5 gms.	184.3 gms.
1-29-46	175.0	177.3	180.8
2-5-46	171.8	178.4	176.0
2-12-46	174.9	179.4	176.8
2-19-46	175.9	178.3	174.7
2-26-46	174.3	178.1	176.8
3-12-46	169.5	173.4	171.2
3-25-46	172.4	176.4	172.7
Total average gain or loss	+0.2	+0.9	-11.6

the pen with the roof ate 19.9 grams, and the pen with no protection ate only 16.8 grams each day. It was noticed that pen 1 (no cover) showed a difference in selectivity from the food materials provided, while the feeding habits of pens 2 and 3 were more nearly alike. It was assumed that it would be necessary for the unprotected birds to eat more to maintain their body temperatures during exposure, but, since this was not true in one case, it would appear that these birds were choosing a more concentrated diet from the mixed grains. Also, since the birds with cover were inclined to stay underneath it most of the time, it was thought that a difference in the amount of vitamin D synthesized through solar radiation might affect the nutrition or general health of the one group.

Essentially, the experiment was repeated during the 1947-48 winter near The Pennsylvania State College. The 1947-48 winter was ideal in its severity for this test. Two groups of Pen-reared birds (10 each) were confined in the same 10x12 foot wire pens on open ground where no protection from wind, temperature, or precipitation was afforded. As before, one group was provided with an abundance of cover in the form of corn fodder, pine boughs, straw, etc. The other had no protective cover whatsoever. Both groups were supplied an excess of high-quality quail mash and water at all times. Extremely severe temperatures (a minimum of 28° below zero and several nights below -20° F.), heavy snowfalls, and high winds appeared to have no ill-effects upon the exposed bobwhites. No mortality occurred within either group, and weight losses were negligible. This, and other experiments of similar nature, would indicate that much of the winter losses of bobwhite quail can be attributed to nutritional deficiencies.

Nestler and Langenbach (1946),

experimenting with bobwhites in cold chamber, had no birds die sub-zero temperatures even though the temperature was reduced to low as -12° F. They stated: "Conditions as severe as 12° below zero did not seem to trouble either pen-reared or wild birds."

Kalbfus (1912) observed: "Whether the winter last past was severe or not so far as low temperatures were concerned, our game birds, such as the wild turkey, the ruffed grouse, and the quail, seem to have wintered well, and the contention that the birds, if kept dry and well fed will not seldom freeze, no matter how severe the weather, has been strongly reinforced."

The implication of this research is that, if provided with food in sufficient amounts and of the proper quality, normal winter temperatures will not kill bobwhite quail, and ordinarily, if the ground remains bare throughout most of the winter, enough natural foods would be available to support the quail without the necessity for artificial feeding. Low temperatures only accentuate food shortages caused by heavy snows by necessitating an increased metabolism, and a consequent greater need for more food to maintain heat balance within the body.

*High environmental temperature.* An example of the seriousness of excessive heat, particularly when coupled with high humidities, has been cited. However, since shade is nearly always available to wild quail, this seldom should be an important mortality factor. But, during periods of extended drought when foliage is withered and sparse and open water may be unavailable, temperatures above 110° F. in the sun might cause the death of quail particularly among juveniles. In working with adult ringneck pheasants at the Loyalsock Experiment Station, the senior author found that birds similar to those which could survive two

three weeks of constant zero temperature without food would die tentimes within a few minutes when the temperature was  $108^{\circ}$  F. and the humidity around 80 per cent. Several internal temperatures as high as  $116^{\circ}$  to  $117.4^{\circ}$  F. were reached during these tests. It is assumed that similar conditions would be unbearable to bobwhite quail.

**Rain.** The ill-effects of rains are most noticeable upon small quail chicks, and there is no doubt but that it is an important cause of juvenile mortality nearly any year in Pennsylvania. It is also possible that during the winter when heavy prolonged rains are followed by rapidly dropping temperatures and a cold windy night, even adult birds may suffer serious harm. Nestler and Langenbach (1946) had 33 per cent of their wild birds and 26 per cent of their pen-reared birds die on the experiments, . . . "most of them during or shortly after precipitation. . . Rain was feared by the birds more than severe cold. Sometimes the quail cried with alarm during an entire storm. Even the wild birds seemed to face a cold rain with terror."

**Drought.** Severe drought is uncommon in Pennsylvania, but there are occasional summers when quail could be adversely affected by the "dry spells." Leopold (1933) explains that the excessive heat and dryness of the soil may cause many clutches of eggs to spoil before hatching because of an abnormal loss of moisture from the egg and a "cooking" by the hot sun when the hen is away from the nest. Droughts have been shown to cause a decrease in quail population in some states, while adjacent states with more normal weather would show increases.

Errington (1933) found that the 1934 drought in southern Iowa had a delimiting effect upon the bobwhite in that region. Bennett and Nagel (1937) reported that the 1934

drought resulted in a fall population only half the size of that of the previous fall, and only six per cent of this number were young birds of the year. They summarize the ill-effects of the drought in Missouri on bobwhites as follows: (1) a failure of many coveys to break-up and "pairoff" until after the drought was broken in mid-August; (2) a probable high incidence of spoiled eggs or abandoned nests; and (3) a considerable juvenile mortality of those which did hatch successfully. Leopold (1933) also reports the tendency of quail coveys to remain intact during drought periods.

**Wind.** As would be expected, wind is of little consequence except when the quail are unable to escape from it by entering dense cover or by utilizing depressions in the ground or snow. If deep snows become overlain with a thick crust and herbaceous cover is sparse, then a strong wind will cause a decided increment in the heat loss from the surface of the quail's body. This loss of heat to air currents is called convection. In still air, the two principal types of heat loss are by radiation (the transference of heat from the quail to surrounding objects colder than the quail by means of infra-red rays traveling across the intervening air space) and by conduction (heat lost directly to cold objects actually in contact with any part of the body). The ruffling of feather as a result of the contraction of the pilomotor muscles, entraps a thick layer of still, moist air around the body and helps to prevent heat loss by convection, but, in spite of this defense, a strong wind will cause the rate of heat loss to increase markedly. As has been explained previously, this added heat loss causes an increase in metabolism (heat production) within the body in an effort to maintain the body temperature at the normal  $107$  and  $108^{\circ}$  F. And, if the rate of heat production cannot keep pace with the rate of



PGC Photo by Batcheler

Technicians banding quail for release.

*heat loss, then the quail freezes.* Gersell (1942) found the survival times of 10 species in wind was decreased by 25 per cent over an equal number at the same temperature but not subjected to air movement. Good winter cover (Japanese honeysuckle, etc.) which would provide protection from wind on cold days and nights might easily save birds which would have perished otherwise had no cover been available. Bobwhites, like most animals, show an intense dislike for high winds, and activity may be decidedly curtailed during these times. The combination of high winds and low temperatures may work real hardships upon bobwhites because, at such times, there is a greater need for food as fuel for the required heat production, but, at the same

time, the quail hesitate to expose themselves to forage for it.

#### Soil Fertility as Related to Quantity and Quality of Winter Food and Cover

From the standpoint of wildlife production, three significant changes have occurred as the over-all fertility of the soil has been reduced by exploitation and erosion. One is a reverse succession in plant species, some disappearing with the lush top soils and others, better adapted to poor soils, taking their places. The second change is a general reduction in size and total productivity of those plants still existing on the land. And, the third is lessening of the nutritive value of vegetable foods produced upon less-fertile soils—that is, less minerals, less vitamin, and a depre-

tion in the quality of the protein, s, and carbohydrates.

Because these changes have taken place so slowly and insidiously, it is difficult for the untrained observer to grasp their full import. Game shortages presently blamed upon changing agricultural practices, clean farming, were winter weather, predation, deer-shooting, nesting and juvenile mortality, etc., can, at least partially, be attributed to this reduction in soil fertility. The elimination of the prairie chicken and the grazing of all available "waste land" has undoubtedly reduced the total amount of cover on the modern farm, but this is probably less importance than the loss of cover upon cultivated fields. Remember the hip-high ragweed in wheat stubbles when you were a boy, the fusion of foxtail in the standing corn, and the dense weed fields of goldenrod, plantain, and clover that were permitted to lie fallow for a year before they were again plowed? Now the ragweed is sparse and seldom gets more than six or eight inches high, the corn is nearly all cut or knocked down and the stubble is almost weedless, and there is no fallow land on the better farms. Even on the submarginal farms where fencerows have not been eliminated and cover sites are everywhere, there is so little ragweed, so little standing corn with foxtail, and so few productive fallow fields that game is nowhere as abundant as formerly. In the better pheasant range of South Dakota where soil is still deep and richly fertile, corn fields are a mass of weed growth and this cultivated land supplies all the food and cover requirements of the bird. And if the soil in Pennsylvania were as fertile at present as it was a hundred years ago, many of the present "ills" would be non-existent, and farm-game species could live here food and cover are profusely intermixed on the same land instead of living a "hide and seek" existence daily risking their lives to move

from a spot of cover of questionable value to a distant supply of natural food and back again. And in winter, a difference of a few inches in the height of food and cover plants often-times could mean the survival or non-survival of bobwhites. And it is known that a good-quality food, one high in nutritional value, is far more likely to induce a high resistance to cold and exposure than many of the "filler" foods eaten only in desperation. When soil is fertile, the birds not only begin the winter in better condition, but are much better able to maintain their weight and vigor throughout the season.

It has been mentioned before, and is emphasized again, that the degree of predatory loss is often directly proportionate to the amount of available escape cover, and, because the extent and density of this cover is so dependent upon soil fertility, it evolves that at least part of this predator loss can be indirectly ascribed to the decrease of soil fertility through soil erosion. In a similar manner, nesting and juvenile losses are certain to increase when cover is sparse.

Finally, hunting mortality may be excessive when the lack of extensive cover concentrates the game upon widely scattered, small areas which are hunted over and over again throughout the entire season.

#### Predation

The bobwhite quail is one of the most susceptible of all game species to predation. Because of its small size, its habits, and the palatability of its flesh, this bird falls prey to a host of enemies from the smallest hawks to foxes and wildcats. Nearly any of the common predatory species in Pennsylvania, avian or mammalian, are responsible for the death of some of these birds each year. The quail can claim none of the immunity that the ringneck pheasant, the wild turkey, or even the ruffed grouse enjoy because of their larger size. A sharp-shinned hawk, a small owl, or a half-

grown house cat, any one of which would probably attack a quail, most likely would completely ignore the larger gainaceous game birds. Many birds and mammals have a restricted list of natural enemies because of certain peculiarities of their living habits—some being arboreal, some subterrrestrial, others aquatic, some hibernate, etc. But, the bobwhite, whose life processes—nesting, roosting, feeding—are all carried out on the ground, is constantly harassed by nearly every predator capable of killing it. Even mice, which are the most common prey animal (except insects) in Pennsylvania, enjoy comparative immunity during deep snows, but the bobwhite is on the surface, exposed by the sparsity of protective cover, weakened by a lack of food, and becomes, in consequence, more vulnerable than ever.

The bobwhite's list of natural enemies is long—most of the hawks, most owls, the crow, foxes, house cats, dogs, raccoons, weasels, minks, skunks, opossums, red squirrels, chipmunks, house rats, snakes, and possibly turtles, shrews, and even other gallinaceous birds (ringnecks and chickens). The aggregate toll taken by these hunters which know no season is undoubtedly a significant delimiting factor, and it might well be one of the forces responsible for the decline of the bobwhite in recent years. Predation is known to be the *immediate cause* of failure of most releases of pen-reared bobwhites in Pennsylvania.

*The Cooper's hawk—Accipiter cooperi.* Individually, this hawk is believed to be the quail's worst enemy, particularly during the winter months, but, because they are not so abundant as some other predatory species, their total effect upon bobwhite populations is believed to be less than that of at least two other animals—the foxes, considered collectively, and house cats.

The Cooper's hawk is relentless in the pursuit of its prey, and most often,

when it has succeeded in locating covey of quail, that covey is doomed. This bird will perch for hours concealed in an evergreen, or other tree, watching and waiting for one of the covey to leave the security of a briar patch or honeysuckle thicket. The moment one ventures forth, even though it be but a few feet, there is a quick swoop, a terrified squeal, and one less breeder for the following season. A Cooper's hawk will literally starve a covey out of its place of concealment, and catch them up, one by one, as they are driven from the security of protective cover by hunger. Numerous observations of "doomed coveys" show that the rate of decrease averages about two birds every three days, although this may vary considerably according to the amount of cover, the proximity of food to the cover, and whether the ground is bare or overlain with snow.

Many farmers and outdoorsmen have witnessed the predatory activities of these "blue darters," and several reported the loss of entire coveys during the four winters of the study and in years previous. Some of these landowners had actually observed hawks in the act of killing, and watched the coveys they were feeding dwindle to nothing. During the winter of 1944-45, when the ground was covered with deep snows for several weeks, Studholme had the opportunity to verify these reports at first hand, for some of the coveys he had under observation were badly depleted or completely exterminated by Cooper hawks.

Many Game Commission field officers have had the unique experience while releasing game-farm quail of having a Cooper's hawk swoop from nowhere and take a newly freed bird while it was still on its initial flight. Latham, while making experimental releases during the 1944 winter, twice had the same Cooper hawk attempt to take birds. In the first instance, the quail had flown

ly ninety yards from the investigator when it saw the hawk approaching across an open field; it immediately turned and fairly raced the hawk right back to his feet, where the quail was saved by a matter of inches by the frantic motions of the observer. Another bird was purposely released as soon as the hawk had flown about 200 yards, and before the quail was able to fly 75 yards the hawk was upon it, but, at the last second, a fast approaching car turned the hawk away. During the same month a quantity of mature ringneck pheasants were released, and at one place a Cooper's hawk plummeted down upon a fully-grown male and knocked it to the ground, amidst a cloud of feathers, from a height of about forty feet.

Although 32 Cooper's hawk stomachs were collected on the study area during the course of the Quail study, most of these were taken during the years of quail shortage and no quail remains were identified in the stomachs. Twenty stomachs with food contained 21 birds—17 small passerines, 1 grouse, 1 domestic pigeon, and 2 unidentified birds. The European starling *Sturnus vulgaris* was found in several stomachs, and has become a very important buffer species for bobwhite quail in the East. Of 282 Cooper's hawk stomachs taken in Pennsylvania and analyzed by the Game Commission, 12 were known to contain bobwhite quail, although the 2 unidentified birds in the stomachs could possibly raise the figure.

*Other hawks.* The red-tailed hawk *Buteo borealis* and the marsh hawk *Ircus hudsonius* are the only other hawks (except the sparrow hawk *Accipiter sparverius*) resident upon the study area (and the state as a whole) during the winter months in numbers sufficient to warrant consideration. Neither of these is believed to be particularly harmful under normal conditions, but quail exposed on snow and weakened by low temperatures and lack of food may very well be

taken by these two hawks, particularly if mice and other prey items are difficult to secure. This mortality suffered during emergency periods may in some cases be merely a hastening of the inevitable, but, in other instances, these quail, if spared, might have lived to reproduce. The goshawk is comparatively rare in south-central Pennsylvania, but when it does take up residence in sections where quail are found, it can be equally as destructive as the Cooper's hawk. A trapper shot a goshawk in immature plumage during the 1946-47 winter, which he believed had already killed about ten of a covey of twenty quail that he had been observing. At least 33 bobwhites were contained in the stomachs of 639 goshawks analyzed by the Game Commission.

The discussion, thus far, has been confined to winter predation by hawks resident within the state during that time of the year. During spring, summer, and fall, the total population of hawks, and the number of different species, is greatly increased. There is no question in the minds of the writers that the total mortality caused by the various hawks in summer exceeds that of winter, but the per cent loss is probably no greater, and the total damage done may actually be less. Nesting hawks undoubtedly contribute to juvenile mortality (Latham 1946), and cause the loss of many clutches of eggs by destroying the incubating parent.

The stocking of pen-reared birds in Pennsylvania has invariably coincided exactly with the northward or southward migration of hawks. Mature quail released in April are placed in a strange environment at the very time when thousands of hawks of all kinds are moving across the state. Most have been released before the new vegetation has become evident, and protective cover is at a minimum for the year. Although it is nearly impossible to present accurate figures denoting the extent of mortality suffered by

these newly stocked quail from avian predators, nevertheless it is logical to assume that it is considerable, especially when it was substantiated that comparatively incapable predators (house cats and school children) were able to catch them with little effort.

Similarly, the hawks return in the fall, and several hundred may be sighted following the tops and sides of a mountain on a good day. Over six hundred were counted by the writers in a few hours from an observation point on a mountain in the study area, and this mountain attracts fewer numbers of migrants than some of the other mountains in the state. Also, this six hundred did not represent all of the hawks passing on that particular day, because many were out of sight of the point of observation.

*Owls.* Several owls are indigenous to the state and the study area. The great horned owl *Bubo virginianus*, by far the most destructive of the resident owls, is most abundant in the northern part of the state where the climate is less favorable to the prosperity of the bobwhite than in the southern part. A five dollar bounty is paid for this owl, and the annual presentation has varied between 600 and 1,300. Langenbach and McDowell (1939) in analyses of 492 great horned owl stomachs from owls sent in for bounty during the months of November through May, 1937-38, were able to identify the remains of four quail. In the same stomachs there were 42 unidentified birds, some of which could have been bobwhites. Although the number of stomachs was satisfactory for a fair indication of the great horned owl-quail relationship, only a little more than fifty per cent of these were from "quail counties," and the collection followed only one year after the most disastrous winter loss of quail (believed to have exceeded ninety per cent) in the past fifty, or more, years.

Errington, Hamerstrom, and

Hamerstrom (1940) in their studies of great horned owl predation in the north-central states found quail remains in 3.7 per cent of the stomachs and pellets examined. In smaller lots representing family groups or localized areas, the percentage ran as high as 22 and 33 per cent. These investigators felt that the greatest mortality occurred when the quail population exceeded the carrying capacity of the land, but that during emergency periods of winter, the loss might include more than this excess. Errington and Hamerstrom (1936) state "on our observational areas, horned owls have probably killed more winter bobwhites than all of the other predators combined; Cooper's hawk and marsh hawks ranked a weak second and third . . ." In Pennsylvania, this owl cannot be accused of such serious depredations, for, if the number presented for bounty represents only 10 per cent of the total population, the distribution cannot be more than one great horned owl for each 4.5 square miles.

The barred owl *Strix varia* is fairly common, but little has been recorded concerning its food habits in Pennsylvania. Only two stomachs were obtained during the Quail Study, and one of these contained a gray squirrel *Sciurus carolinensis* and the other screech owl *Otus asio*. Errington and McDonald (1937) report finding quail in the stomachs and pellets of barred owls in Iowa. This owl and all of the other owls native to Pennsylvania, with the possible exception of the great horned owl, may take occasional bobwhites, but they probably exert little influence upon the abundance or scarcity of the bird. Barn owl *Aluco pratincola*, long-eared owl *Asio wilsonianus*, and screech owl were common on the study area, but no evidence was found that they were destructive to bobwhites, even though a large number of pellets from the first two species were analyzed. The short-eared owls *Asio flammeus* were

nparatively rare on the study area. *The crow.* The crow *Corvus brachynchos*, which is certainly the most abundant winged predator in Pennsylvania, is accused of many misdeeds, the least of which is its proclivity nest robbing. In order to ascertain nesting losses attributable to the predations of the crow, over 700 were shot during the nesting seasons two years (1941 and 1946) and the contents of their stomachs examined.

In the 664 stomachs, only 19 contained eggs. Because of considerable fragmentation, bleaching, and drying, 19 of the eggs were positively identified to species. Some were obviously too large or too coarse to have been bird eggs, but others could very well have been. Juvenile birds, mostly alacial kinds taken out of the nest, were found in 36 of the stomachs. As many as three were found in a single stomach.

Many farmers who have reared chickens by the old-fashioned hen method have lost young chicks to crows. If a crow catches a hen and her brood some distance from the farm buildings, it may dart down and pick up a chick and fly away with it. Very likely the same thing happens with young quail or ringneck chicks, but the extent of this loss is nearly impossible to determine except by the analysis of many hundreds of crow stomachs taken during the spring and summer on areas where quail are reasonably plentiful.

The crow is seldom considered as being a predator except during the spring and summer when its destruction of nests and immature birds and mammals is well known. However, it was brought to the attention of the investigators on several occasions that, during periods of deep and continued snows when the quail become weakened from cold and lack of food, the crows would attack, kill, and eat an entire covey. This was further substantiated by the observations of one of the Game Protectors in Fulton

County. The quail mortality from this source was particularly pronounced during the 1935-36 winter. It is quite probable, however, that quail which have been reduced to a physical state wherein they can no longer escape from a crow will not survive the winter anyway, even if unmolested.

*The red and gray foxes—Vulpes fulva and Urocyon cinereoragenteus.* Within the confines of the study area and probably any place in Pennsylvania where they are abundant, foxes are believed to be the most important natural enemies of the bobwhite quail. Of the two species, the red fox is probably the more destructive to quail, not because of a difference in food habits, but because of a difference in habitat selection—the gray being more inclined to shun the open farmland where quail populations are greatest.

During the first fall and winter of the investigation, fox stomachs were collected from the census area (Fulton County) as well as from Franklin and Cumberland Counties. At this time, the native bobwhite population in Fulton County was established at about 8,000 birds, or one bird for each 22 acres. The remains of two bobwhites were found in the 16 Fulton County red fox stomachs analyzed for this three-month period (Dec., Jan., and Feb.), and one quail was found in 23 gray fox stomachs from the same county. Although the sampling was small and the possibility for error, one way or the other, was great, these food habits figures would indicate that a considerable share of winter mortality could be attributed to foxes. Since the 1943-44 winter was quite mild, there is no reason to assume that these occurrences were the result of the foxes eating birds that had died of exposure or starvation. Two of the quail had been taken about the middle of January, and the third during the first week in February.

Observations of quail "kills" by

foxes are common in Fulton County. Many of the farmers, trappers, and fox hunters who have been interviewed during the course of the investigation have seen the unmistakable evidence of this predation in the snow. Following are a few typical examples: James A. Mellott, while following the tracks of a red fox (the fox was later started and chased by the hounds) on January 22, 1944, saw in the snow where this fox had killed five quail during the previous night—two from the first covey, two from the second, and one from the third. William Ritz, who traps a goodly number of foxes each year, has observed several instances where foxes have killed quail in the snow. He reports at least three killed from one covey at one time. During the late fall and early winter of 1944-45, prior to the deep snows of January and February which caused a 90 per cent mortality of bobwhites, he examined the stomach contents of his trapped foxes and reported finding quail remains in several of them. Although this man is not qualified to carry out food habits research on a technical basis, nevertheless his years of experience in hunting and trapping enable him to recognize a quail if a good portion of it still remained in the stomach. A Fulton County farmer reported having a fox, in one night, kill all but three of a sizeable covey which he had been feeding for several weeks. This was nearly exactly duplicated at another farm.

After the severe loss of the 1944-45 winter, no fox stomachs were collected in Fulton County, because the quail-acreage ratio for the 1945-46 and 1946-47 winters was about one bird for each 320 acres, and it was felt that little would be gained by further food habits studies when bobwhites were so few. In fact, there were probably more foxes in Fulton County during these two winters than there were quail.

As was pointed out in the discussion of the results of pen-reared quail releases, probably foxes account for great many newly stocked birds. This was most forcefully demonstrated when the investigators checked the survival of the 1,000 spring-released quail. Although no fox stomachs were secured at this time and no detailed studies made, it was interesting to note that no sight or whistle records were received from areas where coveys were released in the near vicinity of fox dens. These den areas were located later from the activities of fox families, particularly where poultry damage was pronounced. In this connection, Wilson (1946) found two quail in 10 gray fox stomachs from the Woodmont Rod and Gun Club grounds in Maryland which is located a very short distance across the state line from the Fulton County census area. Three hundred propagated quail had been stocked on the club grounds in September, and the fox had been trapped on the same property from October to March of the same year. Twenty-two red foxes taken during the same time contained no quail. The trapper believed that nearly all of the 300 quail had been lost within a month after release, principally as a result of fox predation.

Mitchell (1941) in searching fox dens for food items around 26 red fox dens during the spring and summer of 1939 in west-central Ohio found the remains of 62 animals of which 5 were bobwhites.

*House cat—Felis domesticus.* The house cat population for the study area will easily exceed one animal per farm, which means that a sizeable number of potential killers are, at all times, preying upon the resident wildlife at every opportunity. Its predation on quail would be far less severe if it were not for this bird's habit of coming to the farm buildings for food.



PGC Photo by Latham

*The roving house cat—exceeded only by the Cooper's hawk and the fox as a quail predator.*

ring periods of deep snow. Easily 60 per cent of all coveys in Fulton County, at one time or another, came near farm buildings for food during the 1943-44 open winter. During severe winters the influx is even more pronounced. These coveys feed out of the feeding troughs, around the straw stacks, and even roost in the wagon sheds in many instances. It is during these visits that the house cat is able to prey most effectively upon the bobwhite quails.

Although the 37 house cat stomachs collected during the study contained no quail, one was shot while stalking a covey, and many reports were re-

ceived concerning this feline's ill-effects upon them. Of nine nests destroyed by predators during the summer of 1944, house cats were responsible for the loss of three by killing the incubating female. Similarly, in 1946 another hen was killed upon the nest by a house cat and the setting lost. Beside the large numbers of mature prey killed by this animal, countless immature birds and rabbits are taken during the spring and summer.

Of eight quail released by the senior author in Chester County in the spring of 1942, two were taken from the stomach of a stray house cat killed at the site of the release just

two days after the birds had been stocked.

The house cat is no match for the Cooper's hawk in its individual capability for killing quail, but the cat so far outnumbers the hawk on the study area, and in the state, that it easily becomes next most important to the fox in its quail killing achievements.

*Mink—Mustela vison.* The only information received during the course of the study concerning the possibility of minks killing quail was one record from a reliable trapper who followed the tracks of a large mink for a short distance in the snow during mid-winter (1947) and saw where it had killed one quail and three rabbits. It had eaten a good part of the quail, a little of the first rabbit, but practically none of the final two rabbits.

*Other terrestrial predators.* Weasels, skunks, opossums, raccoons, snakes, and other ground predators are all believed to exact some toll from the numbers of quail, or their eggs, at some season of the year. However, probably none of these, when occurring in reasonable numbers, is capable of controlling bobwhite quail populations.

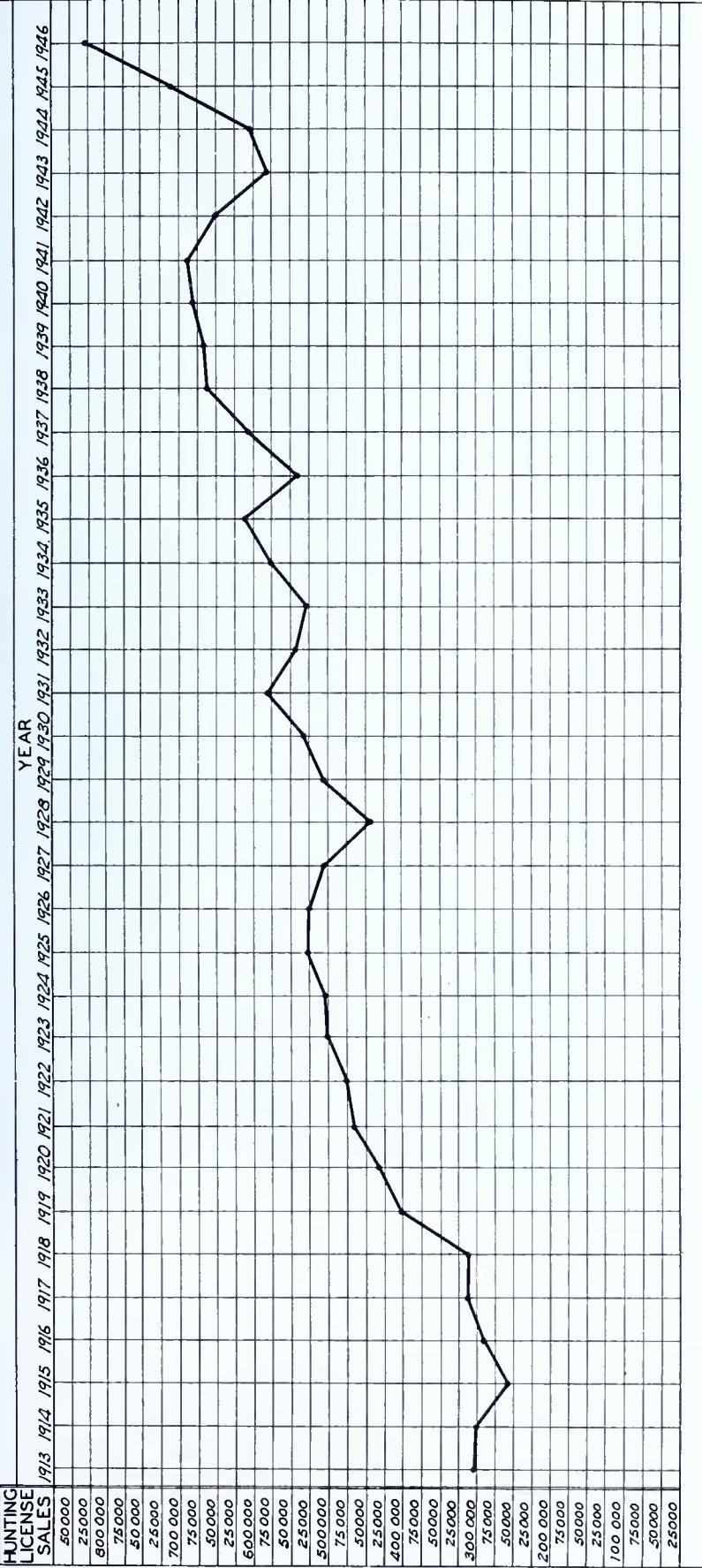
#### Hunting Pressure

Bennitt and Nagel (1937) estimated that the hunters killed fifty per cent of the fall quail population each year in Missouri. During years of abundance, the annual kill of bobwhites in Pennsylvania might reach forty to fifty per cent, but during low years hunting mortality probably falls to a twenty to thirty per cent level. The tendency of the average hunter, and an admirable one, is to "leave them alone" when quail become scarce in the hope that recovery will be speeded. This commendable attitude of the Pennsylvania sportsman indicates a realization of the necessity for preserving an adequate breeding stock and a willingness to forego a limited amount of shooting for one or more years to insure the perpetuation of

the sport in the future. Because this inclination of the hunters spare the quail during periods of pressure, it is believed that hunting is not, at present, a potent factor in the prosperity of the bobwhite. However, there is reason to believe that this kill, even though greatly reduced, could be partially responsible for the slow rate of recovery from severe winter losses. It might, therefore, be a sound management policy to close the quail season for one year following each winter of unusual severity, i.e., 1935-36 and 1944-45. The annual kill for the fall of 1936 was 105,222, and in 1945 it was 12,014. If only one third of these had survived until spring, it would have meant seven thousand more, good-quality natural breeders for reproduction. Sometimes a ten to twenty per cent variance in the breeding population can mean the difference between a slow, struggling recovery and a rapid rebound.

On the Fulton County census area hunting of bobwhites is even more restricted and limited than in most other parts of the state. The feeling of the native landowners is that the bird is decidedly beneficial in the control of injurious insects and is "hard worth a nickel shell anyway." For these reasons, probably ninety-five per cent of the farmer-landowners protest that they never have killed any bobwhites and do not permit others to kill any. The almost universal answer to a request for permission to hunt is "You can shoot any other game, but leave my quail alone." This attitude of the Fulton County farmers aids in the evaluation of the releases of artificially-propagated quail because it nearly eliminated hunting as a serious mortality factor. If the stocked quail could not succeed even in the absence of this pressure which might ordinarily be expected to take a twenty to forty per cent toll, then it is probable that, if the hunting had been normal, their existence would have been even more ephemeral.

FIGURE 6  
THE EVER-MOUNTING HUNTING LICENSE SALE IN PENNSYLVANIA.







## Part IV

### MANAGEMENT

uccessful management of the bobwhite quail is attended by nearly endless complexities of plant and animal relationships. The proper interpretation of this ecology and its application in the field requires more than a superficial understanding of these intricate associations. For instance, predation may be important as a deciding factor under certain conditions, and predator control might seem to be the obvious course to follow in an attempt to reduce this loss. However, as much, or more, might be accomplished by providing protective cover in the right places, and thereby eliminating the necessity for this expensive and nearly continuous control. Similarly, if more and better quality food were available in winter, the quail would be stronger, more alert, and consequently better able to escape their natural enemies.

Thus the provision of food and cover of the right kinds, in the right quantities, and in the right places

(relationship or proximity to each other) might eliminate the necessity for predator control, emergency winter feeding, artificial propagation and restocking, restricted seasons and bag limits, trapping birds and holding them in captivity over the winter, and other management practices commonly used at present and in the past. The restoration or actual placement of this food and cover can be accomplished in two ways: (1) by increasing soil fertility through the application of soil conservation principles, and (2) by planting food and cover where needed upon lands not utilized for agricultural or silvicultural purposes. Neither restorative measure can show immediate results, but *their value lies in their efficiency and comparative permanency*.

Each of the various management possibilities, both negative and positive will be discussed, and an attempt made to evaluate each in its relation to bobwhite quail production.

### NEGATIVE PRACTICES

#### RESTOCKING

##### Ineffectiveness

For some years prior to the inception of the Quail Study, there had existed a growing suspicion that the quail stocking program was not accomplishing the desired results in Pennsylvania. Obvious gains were

difficult to detect even after large-scale plantings, and recoveries from winter loss were exceedingly slow even though 10,000 pairs, or more, were liberated during some years. The findings of the Quail Study have demonstrated the ineffectiveness of stocking pen-reared quail upon areas which offer an environment similar to that

found over much of the state. The reader will notice that the above statement has been qualified in two ways. This was intentional, because it may be entirely possible that a bird of higher quality—one possessing greater resistance to cold and hunger and one better able to escape its natural enemies—might succeed where the present stock has failed repeatedly. And, this same pen-reared bird, which appears to be unable to adapt itself to an environment typical of most of Pennsylvania, might prosper where the climate was less severe, where food was nearly constantly available, and where predation was less acute.

That little is gained from these quail releases was forcibly demonstrated by research conducted in three counties of the study area. During the first two years of the Quail Study, the releases and subsequent investigations were carried out in the conventional manner—that is, the birds were liberated in small numbers upon comparatively small, carefully chosen areas, and an attempt was made to ascertain the success or failure of each planting. Field reconnaissance with bird dogs, banding, trapping, questioning land-owners, and other methods were used for this purpose, but too often the fate of the release was never determined, and, of those which were successfully studied, the total results were too meagre to permit the formation of positive conclusions. For this reason it was decided to use an area of sufficient size and birds in sufficient numbers to establish indisputably the value or lack of value of quail stocking in Pennsylvania.

The area chosen, and one admirably suited for the purpose, was Fulton County in its entirety—over 400 square miles of some of the best quail range in the state. This county is separated from the two counties lying to the east and west by high mountain ranges which extend the full length of the boundaries. Two more of these north and south mountains running

through the interior separate Fulton County into three parts, each isolated from the other by the nearly broken mountains upon each (Figure 7). By subtracting the usable range as represented by wooded parts of the mountains, two outer divisions each contain about 75 square miles and the middle division about 125 square miles of potential quail habitat. The three experimental divisions were much alike in every respect, except area, and census for the peak year of 1942 showed a marked similarity in numbers of quail produced per acre. With this equitable beginning the first division was stocked with pairs of pen-reared quail (adults) April; the second division received supplement; and 500 pairs of 12 to week-old bobwhites were released in the third division in September. A county-wide census made just prior to the April release showed 18 natural coveys in Division 1, 31 coveys in Division 2, and 18 in Division 3. Since the middle division had a greater acreage than either of the other two, the starting population, computed upon acreage basis, was very nearly equal.

*Division 1.* At the end of one year the March-April census revealed the presence of 18 coveys, only 11 of which were designated as positive, though this division even though the 1,000 stocked birds had had one full season to reproduce. It was obvious soon after the release was made that the newly planted birds were suffering pronounced mortality. The evidence would indicate that at least 70 percent of these quail had died or were killed within the first month after release. Some few appeared to have died of internal ailments of one kind or another and an occasional one was probably killed accidentally, but by far the greatest proportion of the dead were believed to have been killed and eaten by the several kinds of predators common to the region. The house cat was probably responsible for



PGC Photo by Latham

here was a growing suspicion that the quail stocking program was not accomplishing desired results.

od share of the loss, because many the quail travelled to the nearest buildings within a short time for release. One farmer reported his neighbor's cat had caught and killed nine of the ten birds put on his farm. Many other landowners reported having the quail visiting their farm buildings and even being inside of sheds or pig pens for several days. This unfortunate asynchrony of pen-reared quail which have been held captive for many months gives the house cat ample opportunity to account for many potential breeders. It was significant that most of the farmers who reported quail coming to their buildings within a few days after release usually saw only small groups of four to six birds which were probably

the survivors of the ten-bird releases.

Wild predators, particularly foxes and hawks, are almost immediately attracted to coveys of newly released bobwhites by their nearly incessant calling and twittering. These sounds carry long distances, and the various enemies of the bobwhite respond quickly to this invitation for dinner. It is not uncommon for a Cooper's hawk to catch a quail while it is on its initial flight following release, and they certainly must be easy prey for most any of the hawks as they go unconcernedly about their feeding. That foxes will respond to mouse squeaks, rabbit squalls, and the distress calls of many birds is well known, particularly when the parent foxes are feeding their young in the spring. It is simply common sense to assume that

pen-reared quail which cannot escape a house cat have little chance against the swift, deadly attack of a fox. Although not based upon direct evidence, it was noted that releases made in the near vicinity of active fox dens were apparently lost very quickly, for no sight or whistle records were received for any of them. Most extraordinary of all the causes of mortality was that of schoolboys stoning a part of one covey to death. These same boys managed to catch others with their hands, and carried them home in their lunch pails. *If the rehabilitation of the bobwhite is to depend upon stock of this kind, it would appear that all predators (and probably schoolboys) will have to be eliminated!*

This release area was checked regularly by the two investigators during the spring and summer, mostly through farmer contacts, and only one active nest was found. About six other nests or broods were reported, and at least one of these nests was destroyed. The female incubating upon the one active nest, when approached, would leave the nest and attack the intruder, picking his feet or hands. When the eggs hatched, she departed with six chicks and left eight pipped eggs in the nest which probably would have hatched in a short while had she remained on the nest. The only other nest actually observed was in a hay meadow, and, when it was exposed by the haying operations, a house cat killed the incubating female after she had returned to the nest. Although there was an occasional successful hatching, there appeared to be almost no survival from these.

Of the 1,000 banded birds released in the spring, there was not a single band returned from the fall hunting season. Although not absolutely conclusive, this would at least indicate a very low survival. Only one band has ever been received from this planting, and it was taken from a bird

which had died in a farmer's garden few days after release.

The spring census of 1947, when compared with that of 1946, disclosed some interesting facts. First of all, despite of the saturation release of pairs of quail, at the end of one year there were exactly the same number of resident coveys as there were prior to this planting, and seven of the were classified as uncertain in 1947 while only 3 of the 18 were uncertain in 1946. Secondly, 7 of the 18 coveys of 1947 were found upon exactly the same covey range as 7 of the previous year, and 6 more were within a half mile of covey ranges occupied in 1946 (Figure 7). Only 5 coveys, all classified as questionable, were isolated and might or might not represent survivors from the spring stocking. The questionable coveys were all small, averaging about 8 birds.

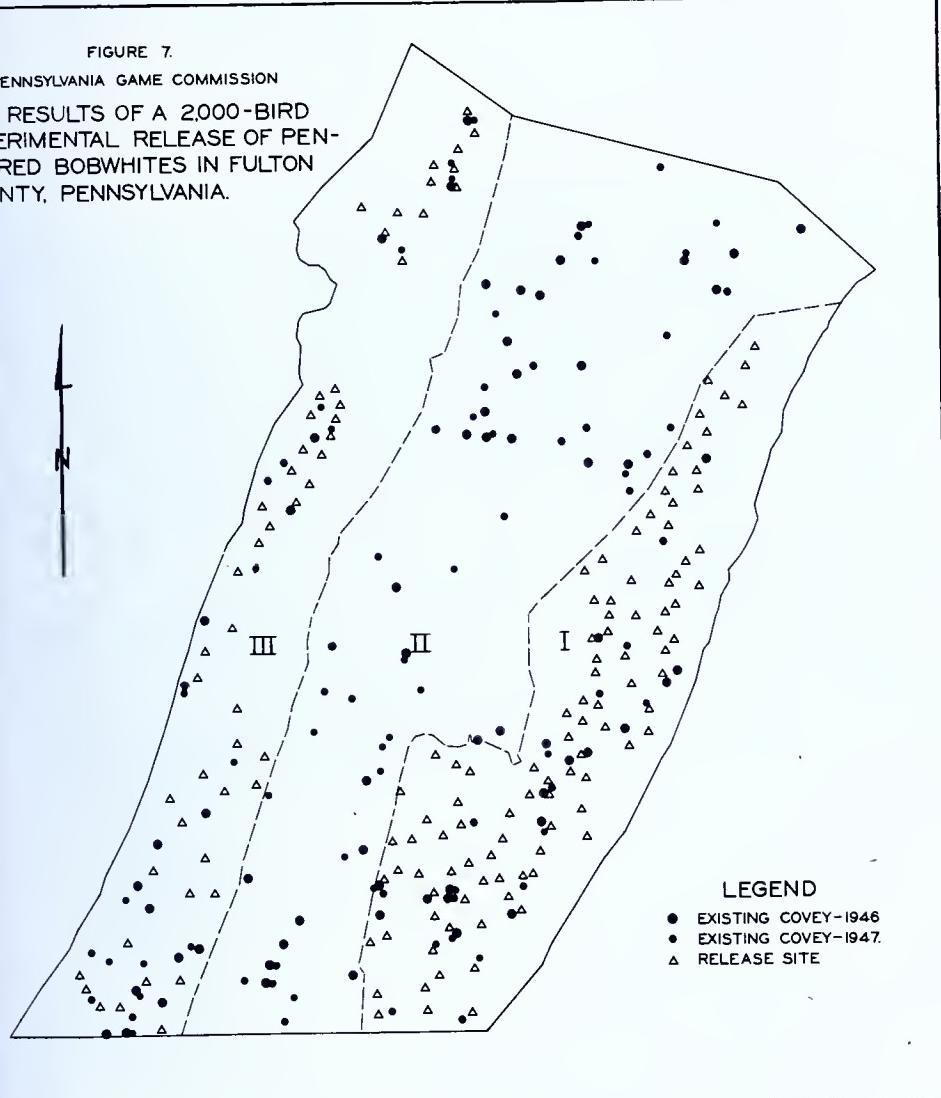
*Division 2.* The middle division which received no artificial supplement during 1946, increased from 11 to 37 coveys from one spring census to the next. Although these six coveys represented only a 20 per cent gain nevertheless it did show that the called native stock was able to maintain its numbers over a year during which nearly all of the 2,000 pen-reared birds were lost. However, the fact that these quail did not show material gain would indicate that even they were of inferior quality, another substantiation of the "pollution theory."

During the questioning of landowners in this division, many stated that they had seen coveys in the fall and occasionally into the early winter but had not seen any quail throughout the late winter or early spring. The commonness of this statement would imply that there was a satisfactory reproduction from the surviving stock of the winter before, but that nearly all of this number, or equivalent, was lost as juveniles as adults, apparently before the crucial tests of mid-winter began. And,

FIGURE 7.

PENNSYLVANIA GAME COMMISSION

THE RESULTS OF A 2,000-BIRD  
EXPERIMENTAL RELEASE OF PEN-  
REARED BOBWHITES IN FULTON  
COUNTY, PENNSYLVANIA.



case the native birds in the other divisions failed to show an increase, it can be assumed with a reasonable degree of certainty that a similar history was typical of the entire county and probably the whole state.

In Division 3. The 1,000 quail released in September were about 12 to 14 weeks old, and were distributed in coveys of 20 birds each. Several of these coveys were located and observed during October, and it appeared from this reconnaissance that survival until the opening of the hunting season on November 1 was

fairly good. The number and size of coveys located would indicate about a 60 per cent survival for the first six or seven weeks after release. As in Division 1, shooting was negligible in this division except for one small area where 5 were killed by the investigators and a few more by persons residing without the county. Although it is definitely known that some birds were killed, only two bands were returned, both by a keenly interested cooperator. He had caught one quail in a trap set for minks, and his son had shot the other during the open season.



PGC Photo by Cady

With good breeding stock, plenty of food and cover, and proper management you should furnish sport for Pennsylvania's hunters without resorting to expensive stocking.

e spring census for 1947 revealed certain and 2 doubtful coveys. was an increase of one covey the total number for the pre-year. Unlike Division 1 which ed practically no survival, if any, the 1,000 bird release, 5 of the ive coveys and the 2 uncertain in Division 3 were believed to be osed of stocked birds. The covey es occupied by the other 12 were ly identical to active ranges of ear before. If these 7 coveys were ned to be composed entirely of ed birds, the maximum survival winter would be less than 10 cent. The principal cause of ality from fall to spring was be d to be predation, although the proof that could be offered was few existing coveys were reported e farmer contacts in late Decem- and early January, even before heavy snowfalls had occurred.

ounty-wide. During the ten-year od following the 1935-36 winter, pen-reared bobwhites have been sed in Fulton County alone. with an insignificant amount of ng pressure during these years, e were only about 750 quail sent to the county when the ng census was made during March April, 1947.

#### High Cost for Results Obtained

nce the functions of the Game mission are financed by the li- fees contributed by the hunters the state, it is the obligation of that mission to utilize the money in the most efficient manner—to pro- the greatest amount of game and reation possible for each dollar ex- ed. Naturally, it is difficult to determine which management pro- cures will produce the most for the money, and many times this can be discovered through the actual plication of several practices and comparison of the results and os of each.

Once a small game species is estab- lished, artificial stocking cannot be considered practical unless these birds or mammals, through natural prop- agation, increase their numbers sub- stantially before the hunting season. That is, if a thousand quail released in the spring would provide five thou- sand, or even three thousand, birds for fall shooting, the expenditure for this stock probably could be con- sidered profitable management. But, since it was found that these pen- reared quail fail to reproduce, and most of them do not survive the spring and summer, this can only be considered impractical and illogical management.

Likewise the release of large num- bers of bobwhites in the fall for gun fodder, even if all live to provide recreation for the hunters, cannot be recommended, for the cost of a single quail for this purpose exceeds in amount the money received from the sale of one hunting license (\$2.00). Such a program, if adopted in pref- erence to all other management practices, *could not* provide directly even one quail for each license holder in the state, even if the stocking of all other game species were discontinued.

If reproduction and survival from spring planting is negligible, money spent for this purpose is almost en- tirely wasted, and, if the mortality of fall-released quail prior to the hunting season is about 40 per cent, then the cost of birds living to supply recreation is actually about \$3.35 instead of the initial \$2.00 (based upon 1945 costs).

#### Stocking Unnecessary

The fecundity of the bobwhite is well known, and as many as 12 to 15, or more, chicks may be hatched by a single pair. This reproductive ability is such that, if environmental conditions are suitable, quail are able to increase rapidly from lows following severe winters, or to maintain

themselves in abundance year after year in spite of reasonable hunting mortality and moderate predation. Since its remarkable fecundity and powers of recovery have been demonstrated so many times, that should be proof enough that stocking artificially reared birds is unnecessary. If the environment is uncongenial, and the resident wild quail are not increasing at the expected rate, or are not maintaining themselves at a satisfactory level, then the addition of pen-reared birds is likely to contribute little to the prosperity of the species, and, in fact, may aggravate an already insecure existence by disturbing a delicately balanced ecological association.

If the money expended for propagation and purchase of pen-reared quail were utilized for habitat improvement, it would probably benefit quail, as well as other game, to a far greater degree.

### DANGERS OF RESTOCKING WITH PEN-REARED QUAIL

#### Disease

Pen-reared quail are commonly beset by a variety of parasites and contagious diseases. If these birds are released in the field and associate closely with wild bobwhites, it is not unlikely that these ailments might be communicated. And, even if there is no direct contact, the over-lapping of covey ranges could cause infection or infestation of healthy wild birds if the land had been contaminated previously by the droppings of diseased birds. The greatest danger comes with spring liberations when pairing begins almost immediately. There is much cross-mating between wild quail and the stocked birds, and the chances for transferring disease from the infected parent to the off-spring are excellent. And once a disease, such as Quail's Disease, is firmly established over a region, or over a state, it may be extremely difficult to eradi-

cate. Quail's Disease has been a stant scourge to game farm opera for the past several years, and ho mortality may be suffered with increasing regularity. Even w quail are reared upon wire, it can disastrous. Is it not conceivable t once started, this disease could a significant role in the surviva of the species?

As early as 1915, Kalbfus (1) mentions that many of the quail ported from Mexico were dying coccidiosis during transit and be release.

#### Ill-effects of Hybridization

This second danger, which, disease, is an ever-present possib when artificially-reared or impo game is released upon areas alre occupied by wild animals of the s species, has been discussed in de in Section 1. *Hybridization may ca a degeneracy in vitality, hardin wildness, protective instincts, or other of the characteristics so valua to wild game, and the propag and release of certain game anim could be contributing directly to decline, rather than the prospe of the species.*

### TRAPPING QUAIL IN WINTER AND HOLDING FOR SPRING RELEASE

An act of the legislature in 1941 legalized this procedure, and for next twenty, or more, years this practice was quite popular and widespread. Many of the older quail hunters still insist that their "game hunting" of those years was almost entirely the result of this management effort. However, there was never a scientific evaluation of the results of this work, and it is likely that the total population was little affected by these comparatively few breedings which might have survived in the wild anyway had they not been trapped.

A limited amount of this work was attempted during the 1944-45 winter

26 quail were trapped, even though considerable effort was expended. Of the 26 birds, 9 were killed by a house cat while still in trap, 3 which entered the trap after it had been inspected just before dark were frozen in the morning, 2 were injured and died while held captive over the winter one cock was killed by the other 2 in late March. The remaining were released in early April in pairs of 6 and 4 on the same land where they were originally trapped. A group of 6 were checked regularly for the next few weeks, and the numbers gradually dwindled until none could any longer be found, and no coveys were found upon that area during the fall and winter nor at the time of the regular spring census of the next year. The group of 4 appeared to be equally unsuccessful, for no nesting birds or coveys were reported for that immediate vicinity.

It is the opinion of the writers that such management procedure is both silly and ineffective, and, even if practiced extensively, its value as a corrective measure is exceedingly questionable. Beside all the possible causes of mortality indicated above, a period of confinement tends to reduce quickly the inherent qualities of self-preservation, and the quails' chances for survival after release are considerably lessened. And, it seems more sensible to attempt to build up the quality of the stock than to spend much time and effort pampering a "bathouse variety" of dubious value.

### CLOSE SEASONS

It has been pointed out that during periods of quail scarcity the average Pennsylvania hunter is far-sighted enough to realize that it is unwise to estimate further the few remaining birds, and he is willing to forego his sport until once more the quail are abundant enough to warrant shooting. Because of this recognition of " shortage years" and this voluntary

self-denial on the part of the hunter, it is believed that close seasons would be of little value to recuperating bobwhite populations, and that a series of these might lead the way to the placement of the bobwhite on the "songbird list."

There is one possible exception to this rule. Following severe winter losses as were suffered during the 1935-36 and 1944-45 winters, it would probably be good management to protect the quail for one season to save every possible breeder for a quicker recovery and to impress upon the hunters that the bobwhite had just undergone another crisis.

### DISPERSAL BY SHOOTING TO PREVENT INBREEDING

It has long been an accepted policy or "must" among quail hunters that quail coveys should be shot into and scattered during the fall or the family group would remain intact over the winter and inbreeding would result the following spring. There are at least two fallacies in this conception. In the first place it has been established that degenerate inbreeding does not exist in wild species from sound stock, so that even if the family group did remain together no particular ill-effects should become manifest. And secondly, the work of Stoddard (1931) and others has shown that rarely, except when coveys are widely-spaced or isolated, do family groups remain intact as such throughout the winter. Stoddard states: "The banding work proves that late in the summer and in fall quail coveys may be composed of one to three pairs of adults and their surviving young, with the addition frequently of one to several unmated cocks, or of pairs that failed to bring off broods. Young bobwhites that get lost from their own covey readily take up with another . . . In general, the greater the quail abundance, the more mixed is the relationship of birds composing the coveys . . . Though there is some

joining together of surviving members of coveys all during the winter, this is most pronounced from mid-winter to pairing-off time . . . It is an interesting circumstance, and one that has misled many sportsmen, that over ground where most of the preceding season's increase has disappeared through shooting and the attacks of natural enemies, the spring coveys should average as large as or larger than those of the fall. It is evident that the *average* late April

covey is composed of the surviving members of various families of the preceding season. These combinations, in connection with the movements of individual birds, as learned through banding, furnish food for thought for those who fear for the future of the quail because of a supposed danger of *close* inbreeding. The observations of Leopold (1933) and Errington (1936), as well as those of the present study, bear out Stoddard's findings in the South.

## POSITIVE PRACTICES

### INCREASING SOIL FERTILITY THROUGH SOIL CONSERVA- TION PRACTICES

It is beyond the scope of this paper to offer specific instructions for the conservation and restoration of the soil. The services of trained personnel are, or will be, available to any land-owner wishing to adopt the program recommended by the Soil Conservation Service. Also, much written material is now available from the Service, and other sources, describing the various land-use practices which reduce erosion and increase fertility. Thus, since the ill-effects of soil erosion have been described already, this discussion will be devoted only to a general resume of the benefits derived from the prevention of erosion and the resulting increased productivity of the soil.

When speaking of farm management and land utilization, the use of the trite expression "What was good enough for Grandpa is good enough for me," marks a man as being either stubborn, narrow-minded, or just plain unintelligent, because it was Grandpa and many more like him who, because of their unscientific agricultural practices, caused the abandonment of many millions of acres of farm land and a needless reduction in the total productivity of most farms still in operation.

Game crops are directly, or indirectly, dependent upon the vegetation produced on the land, and that plant life, in turn, is dependent upon the soil. Good soil produces cover greater height and greater density. It produces food in greater quantity and of better quality. Land from which the soil has been removed by erosion is likely to support few plants and fewer animals. Therefore it is only sensible for any person interested in cropping the land to support a program to conserve and restore the soil. And, luckily for the hunter, when the yield of agricultural crops is increased, game crops increase in proportion. *Everyone benefits from the conservation and restoration of this basic resource.*

### INCREASING THE AMOUNT OF WINTER FOOD AND COVER

After many years of the "trial and error" method during which time number of different management "cure-alls" have been tried, including the refuge system, artificial propagation, the introduction of exotic species, controlled hunting, planting food patches, and others, most wildlife workers now agree that the provision or restoration of proper habitat is the most productive, from a practical standpoint, of all known management procedures. Gabrielson (1946) explaining the merits of th-

t management concept said: "The development of suitable environment demonstrated that this method produce more game and fish annually at a cheaper unit cost than any other method yet found. It is nature's way of producing wildlife and it has enormous additional advantages in well with the vitally important program of soil conservation

management." His suggestions for quail management were: ". . . spend my first money and efforts providing the necessary living conditions over as large an area as the character of the land and its other uses would permit. This would be a sensible thing for two reasons: 1, that with little or no annual expense, these suitable sites would

produce and shelter a new crop of quail each year while others were being developed; and secondly, they would provide the cheapest birds over a term of years. Once the maximum suitable cover and food had been attained, I'd spend annually the necessary money to keep it in top condition, in order to get the continuing benefit of this natural production."

The restoration of suitable habitat, like the restoration of soil fertility, is so desirable because of its comparative permanency and its continuing productivity. So many management practices are, at best, only seasonal in their benefits, and many times the efforts are nearly completely wasted. Artificial propagation and restocking, too often, yields nothing for the

*Every inch of unused space must be made to produce game cover.*

PGC Photo by Latham



hunter's recreation in the fall. Refuges are of no value if the surrounding area offers unsuitable habitat for game. If food and cover requirements are lacking, no amount of sanctuaries will aid in the production of wildlife crops. The introduction of exotic species to lands which cannot support native game crops is almost sure to fail. Restricted seasons and controlled hunting may decrease the amount of game killed but does little toward increasing the game crop. The annual food plot provides forage in late summer and early fall when there is already an abundance of natural foods, but most of these patches fail nearly completely in mid-winter when much of the natural food is unobtainable and when nourishment is need most. Winter feeding is an emergency measure necessitated by the lack of proper habitat. The need for predator control is chiefly caused by a sparsity of protective cover and inaccessible food supplies.

On the other hand, a program for the restoration and preservation of proper living conditions for wildlife, even though its benefits may not be obvious the first one or two years, will produce a greater amount of game over a greater period of time than any of the other regularly used management practices, and has the additional advantage of eliminating the necessity for most other management costs and efforts.

Studies concerning the proper management of the land for bobwhites have been made in several states and the findings reported: Stoddard (1931) in Georgia and Florida; Wilson and Vaughn (1944) in Maryland; Lehmann (1937) in Texas; Errington and Hamerstrom (1936) in Iowa; and many other, smaller-scale studies in other states. In general, the needs are much the same whether in the north or in the south, but different cover and food plants are utilized in each

new geographical region to accomplish the same end. Pennsylvania, and other states on the northern fringe of the bobwhite range, cannot rely upon many of the lespedezas and other wild and domesticated legumes so valuable as food farther south. But in the north and at present, the wild foods natural to these northern states have, and are maintaining quail populations. And it is only reasonable to believe that if these native foods are made more available to bobwhites, both in quantity and by a wider dispersal, that much of the present inadequacies in nutrition would disappear. In this manner, if patches of cover of satisfactory composition are provided adjacent to food supplies, the holding capacity of the range should be greatly enhanced for bobwhites and for other game species as well.

#### By Planting Annuals

The annual food plot, as has been planted in Pennsylvania eight to ten years ago, has failed to accomplish the anticipated results. This was principally because they supplied food at the time when natural foods were abundant and offered nothing in mid-winter when nourishment is likely to be needed desperately. Most of these feed patches, which contained a mixture of millets, sorghums, broomcorn, Kaffir corn, and other grains, were completely cleaned by song birds, game birds, and rodents by November or December. It is likely that plots standing field corn, if weedy or der-sown with some small grain such as buckwheat or soybeans, would provide food throughout the winter, but the cost of plowing, planting, and cultivating is high. In any case, planting of annual feed patches is believed to be less effective for bobwhite production than the more permanent plantings of food-producing and cover-producing perennials.

#### By Planting Perennials

Most hunters have what they



PGC Photo by Latham

*The surviving coveys were found near the Japanese honeysuckle thickets.*

for "best spots." On these they find a year after year, and usually in abundance. What biological factors make these areas better for wildfowl than others nearby? In most cases, the answer is obvious to the trained eye of the game manager, and perhaps even to the observant hunter. Through deductive reasoning, one might say that if the flora were reproduced upon a non-productive area nearly exactly as it exists upon the "game islands" it would be reasonable to expect that this new area would produce game in reasonable quantity.

Working on this theory, a study was made of the various occupied covey ranges in the three counties during the 1945-46 and 1946-47 winter. Because it is believed that the spring, summer, and fall requirements of food and cover are nearly always

fulfilled over most of the quail range in Pennsylvania, only the winter requirements were studied. This investigation concerning the essentials of the winter range was carried out at a particularly advantageous time. The quail population was at an all-time low, and the few surviving birds were leading a precarious existence. Why had these few coveys survived the 1944-45 winter, the constant predatory pressure, and the multitude of other forces continually working against them, when so many other thousands had perished during this time? Why was a covey able to hold its own in a small island of cover, when for miles around there were no other birds? What were the environ-

mental features of these occupied covey ranges that segregated them from other, formerly occupied, coverts? It was felt that the answers to these questions would perhaps indicate the range essentials necessary for the prosperity of the bobwhite and provide a workable plan for future habitat improvement upon quailless areas.

With this in mind, an examination of the occupied ranges was completed, and an attempt made to pick out the features responsible for the continued existence of bobwhite coveys. The results of this survey revealed that the controlling factor in survival, almost without exception, was cover of a specific type. Food appeared to be secondary as a controlling influence in the highly-cultivated Cumberland Valley, but it was at least equally important over much of the sub-marginal lands of Fulton County. In almost every instance where quail were located in the Cumberland Valley, they were making their home in and near heavy tangles of Japanese honeysuckle *Lonicera japonica*. And even more striking, a great majority of these honeysuckle tangles in the valley were occupied by quail, by cottontail rabbits, and oftentimes by ring-neck pheasants. Woodlots, hardwood brush, pine thickets, briar patches, and herbaceous cover almost invariably held no quail unless a fair amount of honeysuckle was intermixed with these other types. Even in Fulton County where cover was far more abundant, the bobwhites demonstrated a strong liking for the honeysuckle thickets and utilized them regularly. Beside its value as protection from weather and predation, this plant appeared to form an important part of the diet in winter, and probably was a regular source of vitamin A. Handley (1945) states that it is widely used as an emergency food in the middle south. Cady (1944) found Japanese honeysuckle in 124

of 552 crops of bobwhites collected in the Norris Reservoir Area in Tennessee during the winters of 1938-About 1.5 per cent of the volume of food in 559 quail taken between November and January in Virginia consisted of this plant, and 8 per cent of the 350 quail crops taken in November in Virginia and analyzed at the Patuxent Research Refuge contained honeysuckle. Mosby and Handley (1943) report the utilization of this plant species for food by wild turkeys, and a total of 15 fruits, 365 seeds, and 28 leaves were found in one turkey. They also report that during zero weather in January 1940, when 26 inches of snow covered the ground, the foliage and berries of Japanese honeysuckle were one of the foods known to have been eaten by the turkeys for over a week, and the birds came through in good condition. The fruits and foliage are a much used by song birds, rabbits, deer, and other wildlife.

The true value of honeysuckle to bobwhites, aside from the fact that it is a near-perfect protective cover plant, is as an emergency food during deep snows or ice storms in winter. When nearly all else has been covered with snow or ice, the evergreen leaves of this plant can always be obtained above the snow or underneath a coating of ice collected by the overhanging leaves. Handley presents analyses of the fruit and foliage of honeysuckle as compared with whole corn, a timothy hay, and the percentages of protein, fat, and carbohydrate content compare favorably with these two common food materials. During periods of extreme cold and deep snow, quail will stay inside these tangles and gain refuge from the severe weather and find sufficient food for maintenance without having to expose themselves to the ever-present danger of predators.

Honeysuckle is easily planted, starts quickly, and the growth is rapid.

is effective cover only when it is nitted to climb over a fence, over piles, or up trees. Dense tangles oftentimes grow twenty to thirty in the air, especially in black st groves. Although this plant ads rapidly, it is easily controlled. wing, burning, and grazing are all tive means for stopping its spread. s intolerant of shade, so that it never prosper under the closed py of woodlands.

here is only one obvious defect, an unfortunate one, of the plant quail restoration in Pennsylvania. It is, in all but the southern part he state, the plant is deciduous. since most of the quail in Penn-  
sylvania are now confined to the  
thern part (perhaps there is a  
elation between the range of the  
it and that of the bird), this is  
of great consequence.

'wo other cover plants were found be of value to quail—mostly for tection from predators. The com-  
n greenbrier *Smilax rotundifolia*

Osage orange *Maclura pomifera* form nearly impenetrable hedges and are armed with stout thorns which turn any winged predato-  
In southeastern Pennsylvania, the age orange is commonly used for age fences, and, when trimmed short, these furnish excellent retreats for bobwhites. The greenbrier is found throughout the state (except where killed out by deer browsing), it, like the Japanese honeysuckle, furnishes both cover and food for game. Its fruit is persistent and the leaves remain green into early winter, al both are eaten in quantity by the ruffed grouse and perhaps, to a lesser extent, by quail.

Osage orange hedges can be grown successfully nearly anywhere in the en. Japanese honeysuckle is an edge point, and succeeds best around orders of fields and roads, in fence rows, and on not too heavily-shaded portions of woodlots. The greenbrier

is tolerant to shade, grows best on damp soil, and is most valuable when near a source of food supply, particularly cultivated fields. These three species should, if extensively planted in the proper places, provide the one element necessary to transform much of the presently unproductive land to areas offering all the habitat requirements of bobwhite quail.

Where food is the controlling factor and cover already exists in adequate amounts and kinds, planting of perennial food-producing plants of the right varieties should offset this shortcoming of the range. Little detailed information can be offered concerning the proper kinds of wild foods to plant, because investigations of this kind could not be carried out during the course of the study. However, certain recommendations for future study or for future trial will be made. Since it is felt that the annual food plot is impractical and accomplishes little more for wildlife than the cultivation already practiced over most of the quail range, the only recourse appears to be to resort to the use of wild perennials or self-seeding annuals. In southern Pennsylvania, several wild legumes are native to the region. These include bush clovers *Lespedeza sp.*, tick trefoils *Desmodium sp.*, partridge peas *Cassia sp.*, and many others. The value of these and other seed-producing plants should be determined in the field by experimental plantings, and the best ones selected for extensive use throughout the quail range of the state.

#### By Cooperative Agreements With the Farmer

Since nearly all of the bobwhite quail and ringneck pheasants, and a great percentage of the cottontail rabbits, are produced upon private lands in the state, it will be necessary in order to benefit these species to carry out habitat improvement work on these privately-owned

farms. This effort should become the joint responsibility of the Game Commission, the organized sportsmen, the individual hunter, and the landowner. All must work together, and each must do his share, to accomplish a task of this immensity. First of all, it will be necessary to have the permission of the landowner before the improvement operations can begin, and he could aid the program materially by donating some of his spare time and the use of some of his farming equipment. Secondly, someone must do the actual work of planting and the maintenance of the plantings. Here all four groups could be employed. Third, someone must provide the technical knowledge and the supervision so that all efforts would be properly channelled, so that time and money would not be wasted, and so that more harm than good would not be done in some

cases. This would be the Game Commission's responsibility.

When, through experimentation, proper methods of habitat restoration and preservation can be ascertained, and when the most productive cover and food plants for each game animal are known, then a state-wide program of environmental improvement should be inaugurated in which every person interested in the welfare of wildlife should take an active part. When all unused space on each farm, presently producing little or no game, is made to produce a satisfactory wildlife crop, the participants in this program will see the fruits of their labors and revel in the added recreation so richly deserved.

#### PREDATORY ANIMAL CONTROL

The relationship between predation and the presence or absence of adequate cover (and food) has been

*For southern Pennsylvania Bicolor Lespedeza shows the most promise for quail feeding and cover.*

SCS Photo



ssed in preceding sections. If I have access to escape cover in short distances of their food supply, mortality from this source is likely to be comparatively unimportant unless an abnormal population some very capable predator exists in the area in question. A careful observational study of the Cooper's hawk, which is considered the most efficient individual killer of the long list of quail enemies, disclosed that it was frustrated regularly in its efforts by honeysuckle thickets, briar patches, or extensive blackberry tangles. Mortality of adult male quail is not believed to be excessive in the absence of snow unless the predatory pressure is extreme. The bobwhite's protective coloration combined with a reasonable amount of herbaceous or woody growth is usually sufficient, when the ground is plowed, to hold this loss to a tolerance level. But during deep snows when much of the value of both food and cover may be lost temporarily, predators may assume undue proportions. At this time that control measures may be especially desirable.

The Cooper's hawk is the only known predator believed to be sufficiently destructive to quail in Pennsylvania to warrant specific control measures. The investigators uncovered many records, including their observations, of Cooper's hawks destroying an entire covey within a few days when deep snows blanketed the ground. Although it cannot be proved definitely, it is reasonable to assume that one Cooper's hawk could account for more than a covey during a winter, and might, in fact, be harassing two or three at a time. Vigorous control of wintering Cooper's hawks between December 15 and April 1 would probably yield excellent dividends, but this control would be difficult to accomplish. This hawk is extremely wary, very quick on the wing, and offers a difficult target for the average shotgun

user. It seldom perches in the open like the redtailed hawk and other *Buteos*, and, for that reason, is not commonly taken with a rifle. *It is doubtful if a bounty payment would materially effect the destruction of the Cooper's hawk during the winter months, and the same payments offered during the remainder of the year would likely be equally as ineffective.* It is possible, however, that Game Protectors and certain sportsmen and farmers who were instructed in the identification of this species and in the most efficient methods of control could materially aid in the survival of wintering bobwhites. If the hunting territory of a Cooper's hawk is located or if this hawk is known to be harrying a certain covey of quail, a live domestic pigeon may be very effective for decoying the hawk within easy range of a shotgun. An hour or two spent in destroying one of these "killers" might mean the saving of at least several bobwhites to produce coveys during the following breeding season.

The bounty and the recent stimulation of interest in fox trapping and hunting appears to be accomplishing much good in the reduction of these animals.

Other wild mammalian predators are not believed to be particularly destructive to bobwhites or their nests unless they occur in unusual numbers. It has been demonstrated many times, in many states, that quail can increase and prosper among reasonable populations of skunks, opossums, weasels, and other small terrestrial animals.

Probably the most neglected of all predatory animals is the common house cat. Very little has been done to control its numbers or its depredations. Because it is nearly impossible for conservation officers or sportsmen to shoot or trap house cats in any numbers for obvious reasons, the only recourse is to educate the owners of the cats, mostly farm-

ers and rural dwellers, concerning the harmful effects upon beneficial wildlife of those permitted to roam the fields. Once a cat "goes wild" and begins to bring rabbits and birds to the farm buildings, it should be killed and replaced by another with more domestic inclinations. Once a cat has learned to catch large prey items, it usually becomes comparatively valueless as a "mouser," and should be little real loss to the owner, especially when he probably owns *several* others. All proposed legislation for the control of this animal has failed to become law thus far, but a cat license act might do much to reduce the total number in the state.

The conclusions concerning the need for predator control in bobwhite quail management are: (1) The only predators which warrant the specific expenditure of money and time for the reduction and control of their numbers are the foxes, the house cat, and the Cooper's hawk. (2) The other, lesser destructive species are generally controlled satisfactorily without any special expenditures or efforts upon the part of the Game Commission. (3) That predator control as a management practice should be considered merely a temporary measure to aid game populations to maintain themselves at higher levels until the more permanent and more effective benefits of improved habitat can be provided.

#### EMERGENCY WINTER FEEDING

Like so many other management practices which are, or appear to be, necessary for the well-being of a particular game species, emergency winter feeding of bobwhite quail in Pennsylvania would not be necessary, or even desirable, if natural foods of the right kinds were available throughout the year. Unfortunately this optimum state has passed or perhaps never existed. Both field and

laboratory studies indicate that most of the winter mortality can be directly, or indirectly, attributed to lack of food, either quantitatively or qualitatively. Partial or complete fasting causes a lowering of the bird's resistance to cold, a physical weakening and a dulling of its sense that it becomes easier prey, and long-continued, may affect adversely the reproduction of the following spring and summer. For these reasons it is vitally important that the birds be supplied with adequate food throughout the winter.

Because little of the quail range in Pennsylvania appears to satisfy completely the winter food requirements of the species, many of the birds go to the nearest farm buildings for sustenance during extended periods of deep snow. This peculiarity of the bobwhites gives the farmer excellent opportunity to aid materially in the survival of valuable brood stock. Other more isolated coveys can be located and fed by sportsmen and game protectors.

Nestler's (1946) work demonstrating the need for vitamin A in winter diet suggests the necessity of a change in the feeding concept followed for years by the farmers of Pennsylvania. It has been standard practice to feed wheat alone, since this grain contains no vitamin A, it is of little value as winter food unless supplemented by other vitamins A-containing food materials. Thus a farmer who has befriended a colony of quail in winter may do more harm than good by feeding wheat alone. These birds are likely to depend solely upon this provided food, because their appetites are satisfied; they will have no desire to forage for the essential supplements. If this restricted diet is prolonged and temperatures remain at a low level, the birds are likely to succumb to the combination of avitaminosis and exposure, even though they have ad-

the food they can eat. Nestler said that *yellow* corn contained a sufficient quantity of Vitamin A to meet the requirements of the bird, it is recommended as a winter feeding substance. Corn can be fed either whole or cracked, but the whole grain will remain edible much longer than the broken grain, because it will not mold or disintegrate so readily. Wilson black soybeans are another rich source of Vitamin A, and could be substituted for yellow corn. Wheat, oats, buckwheat, white corn, barley, and rye contain little or none of this essential vitamin, and should not be used for winter feeding. Mixed scratch grain is not recommended, because it appears to lack the ability to

diagnose their nutritive needs, and, unless their total intake contained a high percentage of the yellow corn, the feeding efforts might be wasted.

Open springs and spring ditches furnish considerable amounts of green forage for quail and other game birds during winter, and if they have constant access to these forage sites malnutrition is less likely to be a causative agent in winter mortality. When these seepage areas are blanketed with snow, much good could be accomplished by shovelling a bare spot and thereby permitting the quail to secure a regular supply of green grasses and other plants.

In spite of the apparent desirability of artificial winter feeding for bobwhites, *it will not always save the*

PGC Photo by Latham

*At least forty per cent of all covies came to a farm house in winter.*



*lives of these birds, particularly if extremely low temperatures persist for long periods.* During the 1935-36 winter, many farmers and sportsmen saw the quail they were feeding die amidst the food which had been provided. Whether the processes of digestion are unable to keep pace with the extraordinary requirements for energy and heat production during periods of low environmental temperatures is not known, but apparently the rate of metabolism is so accelerated that the speed of digestion of ordinary foods cannot sustain equilibrium. The inability of these birds to maintain body temperature by the usual processes accounts for the death of quail, and other birds, while still in good flesh.

#### EDUCATION OF HUNTERS AND LANDOWNERS

Because it is the hunter's money which finances the work of the Game Commission, it is only fair that they should be kept up-to-date on the activities and policies of the Commission.

The hunter and the landowner should, through the medium of movies, publications, and lectures, be made to realize that they must play

an active part in any program the rehabilitation or increase of a game species. The hunter must told that *he should not shoot a covey below eight to ten birds or* remainder may not survive the wter. Both should be instructed in proper procedure and the prop choice of foods for emergency wter feeding. It should be explain to these men, and the facts fo fully presented, that the easy v is not always the best way to h more game, and that habitat provement is likely to pay far grea dividends than stocking many thands of artificially reared or impor game animals. They should be pressed with the fact that the Ga Commission, with its limited fu and personnel, cannot possibly ca out an extensive program of habi improvement and restoration, t that the responsibility rests squar upon the shoulders of the sportsm and much of the work and mon necessary for such a project will h to be provided by them. The Ga Commission will assume the role technical adviser and supply train men to see that the efforts of hunters and farmers are intellige utilized and are accomplishing desired results.





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## SUPPLEMENT

Based upon assumptions presented previously, it was recommended to the Game Commission at the termination of the original study that bobwhite breeders should be selected according to their ability to store and conserve vitamin A. It was suggested that all birds carried over into winter should be placed upon a diet nearly free of vitamin A, and only those which survived an extended period of this vitamin deficient diet should be used as breeders.

This procedure was adopted as a phase of experimental breeding for better stock at the state quail farm, and several thousand progeny from these selected breeders were produced in the next three years. Two tests to determine survival of this experimental stock were made.

The first test was conducted with 5,000 experimental birds on 7 Farm Game Projects located in Mercer and Crawford Counties in northwestern Pennsylvania. These counties were chosen because they both lie within the primary quail range of Pennsylvania and normally have a climate severe enough to test the stamina of the birds. The Farm Game Projects were chosen as release sites because these have definite boundaries, are open to public hunting, and are normally patrolled by Game Commission officers. The 7 projects were censured during early September and were found to contain 456 native bobwhites. The 4,958 pen-reared quail which arrived alive at the release sites were banded and released in coveys of 20 (10 males and 10 females). These birds were freed during September, 1948, at the rate of

1 bird for each 4.2 acres on 23,000 acres included within the projects.

During the following hunting season for quail (Nov. 1 to Nov. 30), these projects were patrolled by 100 Game Protectors for the purposes of determining the total white kill and to recover as many bands as possible. The results of this work showed that 252 banded quail and 100 unbanded birds were killed on the 7 projects. It is problematical why only 5 per cent of the introduced birds were killed while 22 per cent of the native birds were taken by the hunters. A spring census made in April, 1949, revealed that approximately 45 per cent of the game flocks of birds remained on the 23,000 acres. It was not determined whether this unaccounted loss (other than hunting season kill and known predation) represented a movement of the birds from the projects or represented mortality. Winter loss was probably below normal since the 1948-49 winter was very mild, and bare ground was in evidence during most of the winter.

The second liberation test was made at the opposite end of the state in Chester County. This southeastern portion of Pennsylvania is blessed with the mildest temperatures and least snowfall of any part of the state and, therefore, should be most conducive to high winter survival of bobwhites. Chester County also falls within the primary range of the bobwhite in Pennsylvania.

Again the experimental birds were liberated on Farm Game Projects. Prior to the release, the four projects

censused in March, 1949, and native bobwhites were found. The same areas were again censused August, 1949, and this time 227 were reported. During September, 1949, 4,072 game farm bobwhites were set on the 19,154 acres comprising the 4 projects. These banded were put down in coveys of 20 and at the rate of 1 bird for 4.7 acres.

During the fall quail hunting season (November 1 to November 12), 10 banded quail and 20 unbanded were checked by Deputy Game Wardens patrolling the projects.

This harvest represented 2.1 per cent of the game farm birds and 8.8 per cent of the native birds. The February-March, 1950, census revealed that 227 native birds and 1,285 of the original 4,072 game farm birds remained.

During October 16-27, 1950, a fall census revealed 1,418 birds on the areas.

From March 5 to March 15, 1951, a spring census accounted for 365 birds on these 4 Farm Game Cooperative Projects, and during a similar census in late January, 1952, about 319 birds were believed to be on the area.





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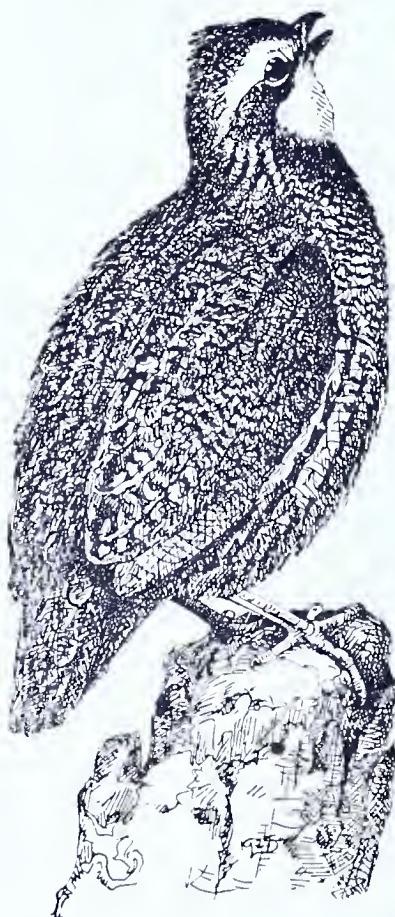
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# SAVE MY HOME



MR. BOBWHITE SAYS:

Save the old briar patches and other shelters if you want us around.

Don't cut all brush along fences and gullies. We need them for protection from enemies and as travel lanes.

Help protect our nests—use a flushing bar.

Keep your cats and dogs under control.

Leave some feed for our use in winter.

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10 CENTS



# THE STORY BEHIND THE COVER

Of all our game species the wild turkey is leading the way down the come-back trail in Pennsylvania. For years the forests of our northern counties defied the efforts of the Game Commission to build up their flocks to satisfactory numbers. Now, within the past few years the turkey population in these counties has taken an unprecedented climb. Tioga, Potter, Cameron, Forest, Sullivan, Elk, and others—these are the new turkey ranges. Where the great bronze birds were once considered a rarity they now exist in flocks of fifteen to fifty. During the past season 8962 wild turkeys were bagged in the Keystone State, an increase of almost 3700 over the figures for 1937, and the northcentral counties were responsible for the bulk of this increase.

Needless to say, all this is good news to Pennsylvania's nimrods, and is reflected in a new generation of avid turkey hunters. Wing bones and cedar boxes are becoming as commonplace as hound dogs, and the hot stove league has dropped the details of the rabbit chase in favor of a discussion of the fine art of fooling a wild tom.

Turkeys have an interesting life history. April finds most of the hens patiently incubating their ten to fourteen eggs in crude nests on the ground. Even though they can run about a few hours after being hatched the fuzzy poult have little resistance to adverse weather conditions and disease, and during their first few weeks many fall victim to foxes, raccoons, weasels, grizzly horned owls and other predators.

The bulging larder of the late summer and early autumn months brings the young birds to the threshold of winter in good condition, and those that escape the bullets and shot of November have a good chance of surviving the rigors of snow and cold.

Early spring is the mating season for wild turkeys. Belligerent gobblers drag their pinions in the dust of woodland roads, and strut and pivot before their apparently unimpressed womenfolk. Bloody battles are often necessary to determine the "best man" of the neighborhood when rival males chance to meet and peace is restored in Turkeyland only with the advent of the nest season.

The wild birds of the Keystone State seem to be doing remarkably well, but in order to meet the demands of increased hunting pressure the Game Commission maintains a Wild Turkey Farm near Montoursville, where the photo on the cover was taken. From this farm and from special woodland propagation areas thousands of young birds are released annually into good turkey range. It is understandable that Pennsylvania, once a shot-and-a-state, now enjoys an enviable reputation as a producer of these grand game birds.

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Cover Kodachrome

by

Ralph M. Cady

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HAVE you ever tramped hopefully into your favorite grouse covert, to find it a parched, lifeless expanse of ashy slopes and blackened stumps? Have you ever seen the dead trout floating about in the eddies of a once-beautiful stream—a stream lobed by fire of its green canopy of laurel and hemlock. Have you ever trod the hot, smoking earth after a forest fire and stood at the sight of withered carcasses of wild creatures whose bewilderment betrayed them to the flames?

Ravaged forests, ruined soil, lifeless birds and animals—these are not pretty sights, to be sure. They are doubly tragic because they are so unnecessary.

April marks the beginning of the fire season in Pennsylvania. Hikers take to the woods by the thousands, snows have melted and exposed the combustable leaf mulch beneath, warmer weather has lured hikers, tourists and nature lovers to woodland trails and highways—and smoke hangs ominously on the horizon on many an otherwise lovely spring day.

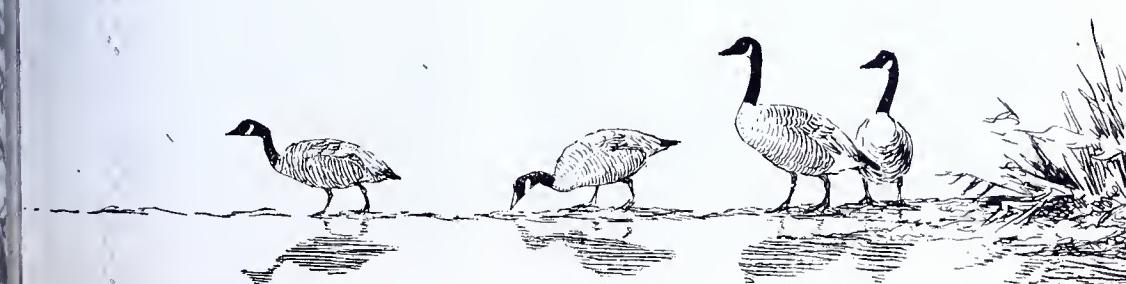
Preventing this tragedy is a problem for the individual, and the first step is to develop a consciousness of the everpresent danger of fire in the woods. *Form safe habits of conduct* when in woods or fields and you will never absent-mindedly commit an act of carelessness.

Analyze your habits. Do you consign your burning cigarettes to the ash tray or do you flick them out of the car window and forget them? When in the forest or field do you carefully grind up your cigarette butts or the embers from your pipe on bare ground or rocks?

How is your fire-building technique? Do you refrain from building fires where they are forbidden by law, or when conditions make it hazardous? Do you shelter your fire from the wind, do you clear away all leaves, brush and other litter from the site. Are you careful about overhanging branches? Do you really extinguish your camp or cooking fire, or do you merely kick a few stones on it or sprinkle it with a few handfuls of earth—leaving it to the whim of the breezes to decide whether or not it will be revived?

On the surface such precautions might seem trivial. But don't forget—all fires have a small beginning. And it's your responsibility to see that the spark you kindle never makes a holocaust of our irreplaceable woodlands.

Fire prevention is up to *YOU!* Put the task of keeping Pennsylvania green on a personal basis.





PGC Photo by Cady

*Sure, it's a duck hawk—but could you identify it in flight one hundred feet up in the blue.*

## *Hawks in Silhouette*

By Frank J. Floss

IT'S apparent from the number of protected hawks that are shot by well-meaning, but uninformed sportsmen, that some foolproof system of identifying our various hawks in flight is urgently needed. Most of our Pennsylvania hawks are beneficial and are therefore protected, but sad to relate, I've seen gunners shoot down protected hawks and swear up and down that they were of an unprotected species.

Common sense tells us the indiscriminate shooting always results in the destruction of more protected hawks than unprotected ones. Why? Simply because the former far outnumber the destructive species. Therefore, a sportsman should be able to identify on sight the various members of the hawk clan.

Studying the photographs and color plates that are published in natural history books seems, at f

nce, to be the answer to hawk identification. It's not. Such illustrations serve only to identify these birds while they are at rest. Because of their very nature the hawk is usually in flight when seen by the hunter—all that is recognizable is the bird's dark silhouette outlined against the sky or cage. Color and markings become indistinct with the movements and grace of a flying hawk. Their silhouettes never change.

Hawks are generally divided into two groups, the beneficial and non-beneficial. The former are protected in Pennsylvania due to their habit of feeding on rodents, snakes and insects. The latter are unprotected and should be controlled.

In the beneficial group we find the Buteos, the Falcons, the Osprey and the Marsh hawk. The Buteos, for the most part, have broad, rounded wings and wide, fan-shaped tails, and do much circling and soaring high in the sky. Red-tailed hawks, red-shouldered hawks and broad-winged hawks are representatives of this group. The others, such as the duck hawk, the sparrow hawk and the pigeon hawk, have long, pointed wings, and, with the exception of the sparrow hawk, which hovers a great deal in flight, are swift and powerful flyers. The marsh hawk and the osprey both have long, narrow wings with rounded tips and the former's tail is rather long.

In the non-beneficial group are the Cypripiters and the Asturs. The Cooper's hawk, the sharp-shinned hawk and the goshawk belong to the genera. The first two are Accipiters and have short, rounded wings and rather long, narrow tails. The goshawk also has short rounded wings, but the tail is proportionately quite shorter. When you have seen three of these non-beneficial hawks, though, you have seen them all, for while differing in size, all three employ the same flight characteristics. They fly low, sometimes only a few

feet above the ground, and progress in flight by alternately flapping and gliding. Seldom do they soar high in the sky.

A study of the pictures illustrating this article will acquaint you with the various hawks' silhouettes in flight. Used in conjunction with a knowledge of their flight characteristics which follow they will enable you to tell at a glance the beneficial from the non-beneficial hawks.

#### Beneficial Hawks

**RED-SHOULDERED HAWK**—This hawk is normally found along river valleys, and other waterways that border wooded areas. It often perches atop an old dead snag watching for prey. It does much soaring and circling high in the sky. It has broad wings and a short tail.

**RED-TAILED HAWK**—Has long broad wings and short tail. Like the red-shouldered Hawk, it often perches on dead snags. It also does much soaring in lazy circles, high in the sky, usually over fields and open woodlots.

**SPARROW HAWK**—This is the smallest of hawks. It has pointed wings. Its flight is light and easy. It is often observed hovering over one spot for several seconds, gently fluttering its wings, while waiting for the opportune moment to drop down on an unsuspecting grasshopper or field mouse.

**PIGEON HAWK**—Usually only found in pine forests, where it nests. It is small, resembling the sparrow hawk, but is a little larger in overall size and a little heavier built. In flight it is swift, powerful and direct.

**DUCK HAWK**—Frequents rock ledges and steep cliffs. It is larger and more powerfully built than the pigeon hawk and has long pointed wings. It flies like a pigeon, rarely soars. Prefers to dart on its prey from a high perch, or overtake it by rapid flight. Too rare to be harmful.

A black and white photograph showing three silhouetted hawks against a very bright, overexposed sky. The top hawk is a Buteo, characterized by its broad wings and long tail. The middle hawk is a Falcon, distinguished by its long, pointed wings and short tail. The bottom hawk is an Accipiter, recognizable by its shorter, more rounded wings and long, deeply forked tail.

BUTEOs  
(beneficial)

FALCONS  
(beneficial)

ACCIPITERS  
(non-beneficial)

Man's-eye view of some common hawk types. Against the bright sky the color and markings of flying hawks are nearly or completely obliterated.

OSPREY—This large hawk is usually found near water. It soars a great deal of the time usually at a rather high altitude. Feeds by dropping into the water from great heights and grasping fish in its talons. Wings are long and narrow, and

when viewed from the front are decidedly angular.

MARSH HAWK — Frequent swampland. Is usually seen flying low over fields or meadows. In low flight it is easily recognized by a conspicuous white-spot at the upper base o

s tail, the upper tail-coverts being white the year round. It has long pointed wings and a long tail.

Of course there are other beneficialawks in Pennsylvania, however, itould take too much space to elaborate on their habits which for the most part parallel those of the aforementioned species. Suffice to say that most beneficial hawks have broad wings and short broad tails. While their not so well liked cousins have most blunt wings and long narrow tails.

#### Non-beneficial Hawks

**SHARP-SHINNED HAWK**—Usually found along hedgerows and rush margins of timberlands. In flight it alternates between rapid flappings of its wings and short soars. It flies low, sometimes between the trees, metimes just skimming the tops, nd sometimes just a few feet off the

ground. It is small in size, has short rounded wings, and a long square-tipped tail.

**COOPER'S HAWK**—Usually frequents second growth timber, and brush grown pastures. It has short rounded wings, its tail is rounded at the tip. It's also a low flyer and progresses in flight by alternately flapping and soaring.

**GOSHAWK**—This is a rare hawk. It only visits Pennsylvania during the winter months. It is one of the most savage of hawks, sometimes it just kills for the joy of killing. Usually only observed in the remote sections of our mountains where evergreen trees predominate. It also has short rounded wings. Seldom circles or soars in the sky. It usually flys just above the tree tops by alternately flapping and gliding.

. . . *The End.*

## 2 GENERALLY HARMLESS HAWKS





Photo by Hal Harrison

Project leader Stanley E. Forbes, examines heavily browsed maple sprouts in an experimental area.

# Semi-annual Report of Research Biologists to the Hunters

*Edited by ROGER M. LATHAM*

THE reports of wildlife research studies are usually written in a technical language difficult for the average hunter to understand. Also, the distribution of these reports is normally restricted to the profession—the wildlife managers and technicians who can use the information to produce more wildlife for recreation. However, many sportsmen are vitally interested in the progress and findings of the various biological investigations being conducted in their home state, and perhaps it should be an obligation of the game and fish departments to keep its hunters and fishermen well informed.

To fulfill this need and obligation, it is planned to have each research biologist summarize his activities and accomplishments semi-annually and present this information to the sportsmen through the GAME NEWS. This is the first of these reports to the hunters of Pennsylvania.

## COTTONTAIL RABBIT MANAGEMENT STUDY

Over Pennsylvania, there are hundreds of thousands of acres of abandoned farm land which no longer produce cottontails in good numbers. The primary purpose of the rabbit study was to determine methods for restoring this land to productivity. By increasing the fertility of the soil, by planting food and cover, by cutting and piling brush, and by other cultural methods, an attempt was made to increase the number of rabbits on three experimental areas located in different parts of the state. Accurate accounts were kept to show the cost of pro-

ducing additional cottontails for fall shooting.

Beside this primary objective, information was gathered on the causes of mortality of both the juvenile and adult rabbits, on seasonal movements, on its relationship with other animals, and on various phases of its life history.

The study in northwestern Pennsylvania is in its fifth and final year. The southwestern and northeastern studies will have been in operation four years on June 30, 1952.

### Northeast Sector

by Wilmer C. Richter, Project Leader

BANG . . . BANG . . . BANG!  
"Did you get him, George"?  
"Yeah, I got him. By darn, it has a yellow tail—first time I ever saw anything like that. Maybe the Game Commission's stocking a new kind of rabbit. Look its got a tag in its ear. I saw a sign somewhere asking hunters to deposit ear tags in boxes. Guess the Game Commission must be doing

something with rabbits around here."

Yes, the Pennsylvania Game Commission is attempting to gain information about cottontails so that your rabbit hunting may be improved. Much land, now abandoned, once supported large numbers of cottontails. Run down and grown wild these once productive areas no longer yield satisfactory rabbit populations.



It was hoped that this land could be restored to productivity by improving food and cover for rabbits.

A tract, which was considered representative of the abandoned farm land in the northeast, was chosen as the study area. This abandoned farm site was located on Game Lands in Luzerne County. The area was divided into two parts—an experimental section and a control area. On the first the food and cover development work was undertaken, and on the second no changes were made. Thus, if rabbits increased on the first and did not on the second, it would be reasonable to attribute the increase to the management work. No predator control efforts were made because this could obscure the results, since it would be difficult to decide whether the increase of rabbits was the result of predator control or habitat restoration.

Determination of existing populations on both the experimental and "control" areas, prior to any developmental work, was accomplished by placing the standard treadle-type box traps at random on the area under study. These random sites then became permanent so that the yearly fluctuations could be checked during and after the proposed developmental work.

Cottontails caught at these sites were tagged, weighed, measured,

sexed, examined for external parasites, and had their tails painted with yellow dye made from a solution of picric acid crystals dissolved in acohol. The cottontails, thus marked, were then released. A card index file was established for each such numbered rabbit and any information obtained from then on, concerning those already tagged, was added to that particular rabbit's card.

Trapping, until recently, was done during the spring, summer, fall, and winter. The spring census was used to determine the breeding stock; the summer trapping was utilized to capture as many young cottontails as possible for survival studies; the fall census was employed to determine the increase in the population through reproduction; and the winter census gave an estimate of the population which survived the hunting season. With the exception of the summer trapping period, when rabbits (especially adults) were difficult to trap, the number of cottontails residing on the study areas was fairly well known.

A great wealth of information can be gained by examining trapping records and the population estimate obtained at the end of each trapping period. First and foremost, we learn whether our population improved or declined. Secondly, we learn whether particular areas are more widely utilized than others. Thirdly, we can follow seasonal movements of the population or specific individual (provided the individuals live long enough to be recaptured). And we learn the composition (age classes, sex ratio, ranges, cover preference) and survival.

Although trapping is a most important source of information, we must not overlook the observations made by the investigator. Observations on nesting success, mortality, food and shelter preference, predator activity, weather and its effect upon rabbit activity, and other factors when combined with the trapping

ogram provides a well rounded plan of action designed to furnish a maximum amount of useful information.

In the next report a resume will be given concerning the developmental work accomplished on the experimental area.

### Northwest Sector

by C. R. Studholme, Project Leader

One of the primary objectives of the cottontail rabbit management study in northwestern Pennsylvania has been to determine the effects of various cover and food improvement practices on the numbers of rabbits inhabiting a study area. Periodic population estimates have been made since the study was begun in the summer of 1947. Since hunters are naturally more interested in the number of rabbits present at the beginning of the hunting season than they are in the population at other seasons, one census was taken immediately before the open season for each year of the study.

The study area was divided into two equal-sized sections at the beginning of the investigation. One of these, called the experimental section, as the one on which cover and food improvement was undertaken. The other, or control section, was undisturbed and served as a check area for population comparisons with the experimental portion. Both these areas were censused with equal intensity at the same time of year.

A comparison of the estimated populations for each section immediately preceding the hunting seasons for each year from 1947 to 1951 inclusive appears in the following table:

ment sites of varying sizes well distributed over the area. These strips supported satisfactory stands of grasses and legumes and were well utilized during the spring, summer and fall by the rabbits. These food patches were surrounded by briars and brush piles resulting from the cover improvement work. These offered good safe hiding places at all seasons and desirable food in the brier canes during periods of heavy snow. Conditions were nearly ideal and the rabbits multiplied rapidly.

In the years which have followed the cessation of cover and food management on the area, considerable change has taken place. The planted grasses and clovers have died out, and goldenrod, cinquefoil and poverty grass have taken their places. Less and less preferred rabbit food is produced as the undesirable plants take over the plots. The cover improvement sites are becoming less effective as the stimulated growth of aspen and pin cherry crowds out the briars and as the brush piles deteriorate with age. Diminishing winter cover and food on these sections mean that fewer rabbits can winter successfully.

A quick glance at the population figures for the experimental section, bearing in mind that management practices were discontinued in 1949,

Year	1947	1948	1949	1950	1951
Experimental section .....	42	84	302	136	49
Control section .....	18	23	83	52	17

Cover and food improvement work was discontinued in 1949, at which time the experimental section offered a desirable environment for cottontails. There were seventeen food improve-

would seem to suggest that rabbit populations might be influenced by environmental improvement alone. However, a comparison of these figures with those of the control sec-

tion will show that changes in populations also occurred on the latter at the same times. Apparently then, population changes were influenced by some other factor or factors in addition to environmental alterations.

Management, potent tool though it may be in increasing rabbit populations, is apparently unable to prevent

the periodic fluctuations of the species. True, the managed section supported many more rabbits at the peak of abundance than did the control section; still the fact remains that population increases and decreases occurred simultaneously on both sections. This was more than coincidence. Future censuses, however, may show a different trend.

### Southwest Sector

by Glen L. Bowers, Project Leader

The major activity during the summer of 1951 was the trapping of the experimental section of the study area. The objectives of this trapping were to capture and mark as many juvenile rabbits as possible and to test a commercial rabbit lure. Altogether, 114 juvenile cottontails were captured and tagged. The sex ratio of these animals was 157 males to 100 females, by far the widest ratio encountered during this study. The cause for this unbalance was not determined. *Rabbit lure was found to be consistently more attractive than apples as bait during warm weather.*

The pre-hunting season trapping, carried on each October since the study began in 1948, resulted in the capture of a larger number of rabbits on both the experimental and control sections than had been taken during any previous comparable trapping period. The results indicated a further increase in the population on the experimental section and recovery from the low population of the previous year on the control section, where the population has remained relatively stable and low. There has been an increase of about 200% over the 1948 population on the experimental section.

Despite the improved supply of cottontails on the experimental area and a further increase in the already heavy hunting pressure, the bag by hunters was low again during the

1951 season. Observations indicate that less than 20% of the rabbits were killed by the hunters. The main factor responsible for the low kill appeared to be the ever-increasing use of woodchuck holes by the rabbits. Factors of lesser importance were weather conditions and the inferior hunting ability of many of the hunters.

*Cooperation of hunters in returning questionnaires concerning the hunting on the study area was again lacking. More than half of the hunters neglected to return the questionnaires, and thus failed to give evidence that they were interested in improving their sport afield.*

While the main development and improvement work had been completed on the experimental area prior to the summer of 1951, certain of the food plots and cover improvements were retreated in various ways in an attempt to prolong the usefulness to rabbits. Additional time will be required to determine the response of these plantings and cuttings to these subsequent treatments; a full report on this activity will be made later.

The response by cottontails to the improvements on the 300 acre experimental section has been encouraging. The total area involved in the development and improvement work was less than 45 acres—48 food plots embracing about 14 acres, 17 cover

aprovement cuttings embracing about 26 acres and several miscellaneous plots totalling less than 5

acres. These habitat improvement activities for increasing the number of rabbits on abandoned farm lands are showing very gratifying results.

## WHITE-TAILED DEER STUDY

*This study has been in progress since February 1, 1951. There are several major objectives in the investigation, but most important are these: (a) To survey the present deer range in Pennsylvania with particular reference to the relationship between the numbers of deer and the avail-*

*able food supply; (b) to determine the effects of inadequate nutrition upon body size, antler development, and reproduction; (c) to determine the extent of deer damage to crops, plantations, and forest reproduction; and (d) to secure information to be used as a guide in setting seasons for deer.*

by Stanley E. Forbes, Project Leader

The White-tailed Deer Study was incorporated into the research program in the spring of 1951. The immediate purpose of the project was to collect all the information possible that would be of value in managing the deer herd; the ultimate purpose as to supply information annually which would serve as a guide to the Game Commission in carrying out a planned program of deer herd management. Because one or more Game Protectors are located in each of the 7 counties of the state, the assistance of all these field men was enlisted. This cooperation is of the utmost value in supplying data which will give a complete and accurate statewide picture. These men are relied upon to furnish data on the deer killed throughout the closed season.

Upwards of 5000 deer are killed annually in this state outside of the regular open season. Most of these deer are victims of vehicles, but many are killed by game law violators, by dogs, by accident, or for crop damage. During severe winters, hundreds, or even thousands, may die of starvation. Six deer are reported to have died of rabies last year. These are the first cases that have been reported within the state—one each in Bedford and Chester counties, and four cases in Susquehanna County.

Permanent records of more than

1000 deer examined by the District Game Protectors last year are in the project files. This represents approximately 20% of the total out-of-season kills.

During the regular open seasons of 1950 and 1951, the personnel of the Research Division collected information on in-season kills by processing these at check stations and locker plants, or by means of roving crews that contacted individual hunters in the field and examined their kill. Throughout the 1950 season, these crews examined 581 deer; in the 1951 season, they examined 1079 deer. Because the weather limited the antlerless kill during each of these two years, more than half of the deer examined by the research personnel were antlered. On the other hand, most of the deer killed during the closed season were females.

Prior to the 1951 open season, an appeal was made to the sportsmen of Pennsylvania to help their own sport by sending the lower jaw from their deer to the project leader to be aged. It was felt that an abundance of important information not available by other means could be secured through this cooperation. Although the response was not as good as had been hoped for, the enthusiasm with which many of them responded was indicative of their interest. In addi-



PGC Photo by Cady

*District Game Protectors assisted the Wildlife Research Division in collecting important data on the deer kill.*

tion to submitting the information requested concerning their kill, many sent along letters expressing their approval or disapproval of the work. Some offered solutions to local problems; others related their observations of conditions in their hunting areas; and still others projected many theories as to what has happened to the deer in the past and of what should happen to them in the future. Their letters and suggestions were gratefully received.

An indication that our GAME NEWS is widely circulated and read was

shown by the excellent response to this request from non-resident sportsmen who regularly hunt in Pennsylvania. In addition to these, many hunters neither residing nor hunting within this state sent in the jaws and supporting information on deer which they had killed in other states. Most of these were received from other eastern states, but a couple were received from New Brunswick. All had the interest of the sport at heart and thought that the Game Commission would be interested in obtaining some comparative data.

d, they were curious about their own specimen.

The jaws and data from about 300 deer were received from sportsmen. Although they represented only about one-half of one per cent of the total deer kill for 1951 and were not much a sample as such, these data, when combined with that collected from various other sources, helped to portray the condition of the deer herd.

What information is important? The answer is ALL INFORMATION. Specifically we are searching for data on the sex ratio found in embryos, fawns, and adults; on the number of young produced per female (both fawn and adult); on the per cent of females (both fawn and adult) that are bred each year; on the length and time of the breeding and fawning periods; on the age class composition of the herd; and on weights, antler development, and body structure.

How will you profit by this information? When we know the age

class composition of the herd, we can closely estimate the annual mortality from *all* causes. When we know the per cent of females being bred and the average number of fawns produced per female, we can estimate accurately the annual replacement. When we know the per cent of females (especially fawns) being bred annually, the average number of fawns produced per female, and the final analysis of the measurements of antler development and of body structure and weights, we have information that will enable us to evaluate properly the physical condition of our deer herd and deer range.

When we know this, we will have the answers to your questions "Do we have too many deer?" or "Are we overshooting our herd during antlerless seasons?" When we know this, we can have a program of planned management for your deer herd. THE PROOF WILL LIE IN THE SUCCESS OF YOUR HUNT.

### Wild Turkey Study

by Harvey A. Roberts, Project Leader

During the past quarter century various changes have taken place in the Commonwealth's wild turkey population. Some of these changes, notably the gradual northward extension of the turkey range and the subsequent increase of this game bird in that region, have been very encouraging. Unfortunately, other alterations of a deleterious nature have also come into being and in some areas actually threaten the very existence of this magnificent bird. With the solution of the problems brought about by these changes as a goal, the Research Division of the Game Commission has recently embarked on a study of the wild turkey.

The fourfold objectives of this particular investigation are as follows: (a) a determination of the causes

for the population decline of wild turkeys on the long-established range of south central Pennsylvania; (b) a determination of the true value of farm-reared birds in wild turkey management; (c) a determination of the practicability of employing artificial insemination in the production of wild turkeys at the Wild Turkey Farm; and (d) a determination of the value of restocking with "native" wild turkeys in areas where the bird has been exterminated or greatly reduced in numbers.

Since July, when the investigation began, a major portion of the emphasis has been placed on a comparison of fall-released tom turkeys obtained from two sources. This work began with the liberation of 50 birds taken directly from the brooder

fields at the Game Commission Wild Turkey Farm. These turkeys, 10-week-old toms, were released in four flocks of 5, 10, 15 and 20 birds each at predetermined localities throughout a section of the state where the resident population was greatly reduced in numbers. Subsequently, every effort was made to reach all liberation points and check each flock at least three times a week. A careful record was kept of all observations including feeding habits, daily movements, general behavior, etc.

Six weeks following the release of the brooder-field or unconditioned birds, 80 more turkeys were released in the same general area. Prior to release, these latter birds had been held for a period of weeks in large hardening or conditioning pens in the mountains. These 16-18 week-old toms were then separated into eight flocks of 10 birds each, released, and studied in the same manner as the earlier liberations.

Behavior after liberation followed a set pattern for conditioned as well as unconditioned birds. In general, turkeys from both groups remained in the vicinity of the release site for approximately one week. This period was highlighted by frequent calling and considerable unrest on the part of most birds. During this first week of freedom predation was especially heavy but as the birds became more accustomed to their new surroundings predation decreased. Aimless wandering usually followed, with some flocks travelling considerable distances from point of release. On

one occasion a flock of these young toms travelled ten miles in six days before they settled down to a routine. Several other flocks followed pipe line rights-of-way and rural roads to the outskirts of small communities or farm buildings, where in most cases, they remained until chased away. Surprisingly enough, the birds from the conditioning pens exhibited this tendency as often as did the turkeys taken directly from the brooder fields.

While the foregoing observations were of necessity confined to a comparatively small number of birds (130) and were the result of only a few months work, there is every reason to believe that post-release behavior has been well established for both groups of turkeys. Furthermore this phase of the investigation has also shown that only slightly more than 10% of the experimental birds released in the early fall were taken by hunters during the open season.

The procedure of releasing young toms in the early fall has been carried on with the sole purpose of providing additional shooting during the open season. Under current practices, however, the Game Commission and the sportsmen are benefiting from roughly one bird in every ten released in the fall. The investigator feels that this unfavorable ratio could be practically reversed if the fall release of toms, whether conditioned or not, was made as close to the opening date of small game season as possible. Only in this way will all concerned realize a profit from their investment in fall liberation of young wild turkeys.



## Woodcock Management Study

by Stephen A. Liscinsky, Project Leader

Although woodcock are not generally considered as being plentiful in Pennsylvania, its hunters have had an average of 22,000 woodcock a year in the last five years. These figures indicate that Pennsylvania is one of the best woodcock hunting states in the northeast. However, many veteran woodcock hunters report that woodcock seem to be decreasing in the state, because they are finding birds in their favorite spots in the numbers they did formerly. A great many of these hunters do not realize that the life of a woodcock covert is limited. Woodcock cover is most productive when the older, aspen, hawthorn or sumac is young—as it might be found a few years following the abandonment of cultivated fields, or the draining of swamps, or after fires or cuttings. After 15 to 20 years, these larger evergreen trees and shrubs grow up and then completely shade the ground. The large part of the ground cover disappears because of the lack of sunlight; the roots of these trees may rob the soil of much of the moisture and it may become dryer and dryer; the soil may become more acid as the years go by; and, in general, the cover may become less and less attractive to woodcock.

The primary objective of this study is to reverse this process and restore the productivity of these "worn out" coverts. Thousands of acres of potentially good woodcock grounds await the results of the management research being conducted. Perhaps a large portion of this land can be rehabilitated with a minimum effort and at minimum cost.

Thinning of over-mature and over-dense cover is one method which it is believed will give the desired results in the shortest period of time. The kind, age, and density of the

cover plants should determine the extent of thinning. The vegetation in some areas advances toward a forest stage, while in other areas it reverts to a brushy or grassy stage. In the former stage, thinning will necessarily be accomplished with hand cutting tools or by simply killing older trees by girdling or the use of chemicals. In the latter stage, where the brush and grass often become so thick as to make the site undesirable for woodcock, the controlled use of livestock, fire, and chemical sprays will be employed.

Soil fertility will also be taken into consideration. It is possible that soil improvement may be a useful tool in woodcock management. Lime and fertilizers will be used in an attempt to ascertain their value in the production of food and cover. Because the abundance of earthworms, which make up 90% of the food in the woodcock diet, is directly related to soil fertility, it is easy to see the possible benefits of soil conditioning. A survey made in several sections of northern and western Maine showed that when earthworms were entirely absent woodcock were entirely absent, even though excellent woodcock cover existed. So, the treatment of the soil may be the answer to earthworm production and, in turn, to an increase in woodcock numbers.

Environmental improvements alone may not produce the desired results. Many suitable woodcock covers appear to be underpopulated because of excessive hunting. Numerous sportsmen claim that the word of "good spots" soon gets around, and it is not long until these spots are "pounded to death." There is reason to believe that if all of the "native" or locally hatched birds are killed out of a covert there may not be any



birds to return the following spring to nest in that particular area. It appears that most of the breeding stock in any covert is composed largely of surviving birds from those which either nested there or were hatched there the year before. If this is found to be true, it will be necessary for the hunter to be cautious about overshooting his best spots. If this fails, seed-stock refuges may prove valuable.

Although the above-mentioned plans are aimed primarily at resident birds, it is felt that flight woodcock will also benefit. It should also be kept in mind that the amount of hunting pressure on resident stock will depend upon the number of flight birds which are available to the gunners during the regular season.

The woodcock management study has been underway only since September 2, 1951, but some progress has already been made. A brief summary of accomplishments follows.

The Bald Eagle Valley of Centre County was chosen as the principal district in which to carry on the investigation. This choice was made

because of the well known history of woodcock in the valley and because of the probable opportunity for management research. Within the district four landowners have already given permission to use portions of their uncultivated land for woodcock management experiments. Other sites will be added as the program develops.

During the 1951 woodcock season 19 hunters cooperated in gathering data on woodcock hunting and woodcock habitat. These hunters spent a total of 394 man hours in flushing 229 woodcock or 1.7 man hours hunting to flush one bird. Thirty-eight per cent of the birds flushed (88) were killed, making the number of man hours of hunting necessary to kill one woodcock 4.5.

Young alder thickets, with open areas and edges of briars and golden rods, made up by far the most attractive habitat for woodcock during the fall. Alder itself was present on 55 per cent of the flushing sites. The biggest percentage of flushes (88) were made along streams in moist lowland areas.

The 1951 migration of woodcock through central Pennsylvania was casual throughout the month of October and terminated about November 6. Although flushing records and field observations showed an occasional influx in the number of birds in the covers, no large scale flights were observed until the last few days of the hunting season (first week of November). The abnormally dry and warm weather delayed the migration of woodcock so long that no appreciable amount of flight bird shooting was enjoyed by the hunters. Indeed had it not been for the resident birds there would have been almost no woodcock shooting this past fall. It seems imperative, therefore, that more consideration should be given to the preservation and increase of our native stock.

. . . *The End*

# Bird House Primer

By Thad A. Bukowski

BOUT two weeks before the last school year began, "Pop" Johnson, diminutive principal at the school in which I teach, called me over the phone and asked with quite a gentle plea that I fill the following quest:

"Tad," he said, "I wonder if you could teach our biology course this year?"

Entirely unexpectant of such a call, I don't readily recall what my answer was but it must have been something such as this: "Sure, I'd give my right arm to do it." For just about that time, and quite belatedly, I'd gotten more seriously interested in the world of nature and the out-of-doors.

And so it happened. Armed with an emergency certification I waded

*The parents of these baby robins knew bird houses were meant for BIRDS, so . . .*

Photos by The Authors



into the classroom, and often floundered, but often, too, thrilled to my newly found knowledge of the living things in the world about me.

One of the pet projects that I assigned as part of the spring program in my classes was the building of bird houses. Since so little of our early schooling is specifically concerned with our immediate natural environment, I thought that perhaps through this medium many a student would be introduced to the problems of the interesting creatures which live in the same habitat with him.

For many a student it turned out to be quite a pleasurable affair. Some regal houses came into the classroom, painted in hues of splendor and splashed with colors bright, domiciles befitting any flying feathered friend in existence. Bird houses littered the biology room—almost filled it, to be exact, for I had two classes totalling eighty students. In the midst of the learning period, many an interesting observation was made by the youths on the bird which each had chosen for specific study.

However, as in all things, for many the interest was as quickly lost as it had been found. Most of the bird houses were taken home with the instructions to "put them up around the house" and this was done. At least promised. A few laggards, however, consistently forgot to follow up on their woodwork, and as the spring rolled on into fuller bloom, I finally gave out an order that all the bird-houses that weren't removed from the classroom by a certain date would be taken home personally by me and set up in vantage points on my own one acre back lot.

This must have been an excellent excuse for the forgetful, for I was left with at least a half dozen houses on my hands. To keep my word, I had to do something. So I went into the bird real estate business. I gathered the diminutive shacks together and took them home.

In the few spare moments that had in the evenings, I affixed first one then another, to the nearest shed or settled them in the nearest trees, scattering them over the acre.

The cherry tree into which the last bird house went was only about seven feet high at the time that I wedged it in its branches and I must admit that I shamefully settled it no more than four feet up from the ground.

I worried about the house in the cherry tree for a few weeks and had every intention of changing it to a more appropriate and secluded spot but the birds were very understanding. A robin came along and wrestled some twigs, grass, mud and straw against one side of the roof of the bird house and the rest of the crotch of the tree. A short while later three eggs appeared. By the time three tiny beaks broke through the shells, I was ready with my camera and tripod and tried, successfully or not, to photograph them at close range.

Ma and Pa robin were jealous parents, and as soon as the young ones were fairly settled I focused my camera but each time I came close to the nest two red breasted dive bombers were at me. Amidst a chattering and fluttering of wings and plaintive squawks they wildly informed the entire neighborhood of my trespass.

It wasn't until fall that I realized that a wren too, had chosen to build a nest inside the house I had put up. I learned that only later when I checked the houses in the fall for cleaning. This should be done of course as often they are overfilled for the season that follows.

For one season, at least, I had had an unusual time enjoying the antics of one of man's greatest aids in combating his enemies. For our feathered creatures, more than any other among all of wildlife, are not only most pleasant to listen to and enjoy for their songs but are also useful as consumers of vast quantities of insect

ts which they so avidly relish. And, I learned last summer, they readily accept even a badly bungled invitation to share the hospitality of your den.

Why not build a few bird houses? easy. Almost any easily-worked wood will do, including that soft pine or old orange or grape crate that may be lying around, a leftover from a large grocery order.

In building the bird house, no detailed rules need to be followed. Usually birds seem to prefer un-painted houses of weathered board. It may have been lying around, exposed to the elements for some time, covered with feathers, and with a dry temperature generally above 100 degrees, there's no wonder that he likes to pick a cool, shady spot to live during the spring and summer. In setting boxes we ought to remember these, plus a few other significant hints that will be mentioned later.

Openings for the bird house entrances should average  $1\frac{1}{4}$  to  $1\frac{1}{2}$  inches in diameter for smaller birds and about 1 1/2 inches for birds of medium size. The average wren house is commonly known to have an entrance hole the size of a two bit piece. Pegs in front of the house seem to serve a useful purpose; in fact, if anything they might help predators to get at the nestlings or mice and other intruders to get into the house. The hole should be placed near the top. Floor space for the average bird would be about 4 x 4 inches as a minimum and up to 6 x 8 inches for medium sized birds. Exact specifications for constructing bird houses for each particular species may be found in various publications, one of which is *Attracting Birds*, a free pamphlet issued by the Pennsylvania Game Commission.

In setting bird houses, crotched

trees are effective, as it seems that a bird would rather live in the house when it is lodged in the crotch rather than suspended rock-a-bye fashion by a wire or some other gimmick that makes it sway. Besides trees, the tops of poles are valuable for housing places as are tops of grape arbors, the eaves of barns and sheds, and the like. Bird houses should be placed approximately within the average heights of six to ten feet from the ground where they are easily accessible for cleaning.

For expediency in cleaning, the bird house should be hinged, so that you don't have to literally tear the house apart to clean it in the fall or winter.

Birds don't mind either if you leave a little straw, short bits of string (long ones get them tangled, sometimes fatally), feathers, or even some good clay around so that they can use it in nest building and patching. I can remember the time I had to disengage a robin from a tangled mass of twine. The bird was bent on using it for a nest but the trouble was that it had started gathering a



*Miss Bukowski seems amused at the thought of Daddy climbing the neighborhood trees to hang his bird houses.*

fifty foot length of cord that I was using to measure garden rows in planting my carrots, beans, peas, and onions.

Bird houses should be placed for maximum comfort of the birds. In shade if possible to be cool, and turned away from the prevailing winds and rains. Facing the entrance east or southeast would probably be the most satisfactory around here, as most of our rains and piercing winds hereabouts blow in from the west or northwest. It would also be a good idea to place our houses to insure a minimum amount of predator damage. Steel clothes poles are good for nesting boxes because cats can't shinny up them, and for wood we might set a tin guard around a tree in such a way that Mr. Tomcat couldn't possibly climb around it. Do not, however, place the guard around the tree in such a manner that it would affect the outer or growing (cambium) layer of a tree, as the tree will die.

Don't go overboard into the bird house business right off the start. Too many nesting boxes around the area may scare all of the birds away, for they need a certain domain or terri-

tory near the box which they can call their own and from which they can feed on the insect life and other food. Neither do birds like houses settled away in thickets or dense woods; it would be almost fruitless to set them there. In shade or sunlight, exposed, the birds like it.

All in all, if you're interested, build a few sensibly constructed houses this year, place them at vantage points where you may study them, observe them and their occupants, and enjoy them. Each year add sparingly to the houses over a wider area of your immediate neighborhood and I'm sure you'll be pleased at the influx of birds into your neighborhood. It is only they who naturally can control the greater millions of insect enemies which are continually encroaching on human life. It is well known that at least 675,000 different species of insects have already been classified on this earth (some authorities raise the figure into a number of millions) and it seems high time to coddle the feathered friends around us. Economically it must, the pleasure in itself is even more satisfying to experience.

. . . *The End.*

#### SPORTSMAN'S INTEREST PLEASES GAME OFFICIAL

It's news when the policeman who tags your auto pays a fine for a parking violation. It's news, too, when the Game Commission's top law enforcement officer is checked by a stranger who wants to know whether he has violated the Game Law.

On a recent evening, as Thomas F. Bell, Chief of the Wildlife Protection Division, drove north of Emporium, a doe deer leaped from the darkness into the side of his car. At the first available spot Bell turned about and drove back to the collision point. While he was in the act of dispatching the injured deer with a bullet, a nearby resident named Pyle appeared on the scene.

Pyle lost no time learning the identity of the shooter and inquiring what he intended to do with the dead animal. He even rode with the game official to the home of Emporium Game Protector Erickson, where the deer was left. It was then learned that the man had memorized the license number on Bell's car—just in case.

The Wildlife Protection Chief was highly gratified at the exceptional interest the man showed. Said Bell: "Even with good deputy assistance, Game Protectors have a difficult time coping with the many law enforcement problems in their respective districts these days. Were more citizens to follow Mr. Pyle's example, the number of violations would decrease and larger numbers of game animals would remain in the coverts for the hunters' guns."



Photo by Maslowski & Goodpaster

*Porky isn't very bright—but then, he doesn't need to be.*

## Meet the Porky

By Jack Anderson

HE'S as odd as a three dollar bill and he rattles like an outdated automobile as he lumbers through underbrush. He's a peaceable character, but don't molest him or there will be trouble.

Until recently you rarely heard of him in the Pocono region. Now he's not uncommon. And since folks know little about him I thought we'd have good look together. What he eats, the peculiar sounds he makes, mys-

teries surrounding his mating, the strange conflict which makes him amiable and yet awesome as a fighter, show him as quite odd and very interesting.

Should you be puzzled, I'm writing about the porcupine. So before we watch his habits let's see what he looks like.

A porky is a chunky, blunt-faced rodent weighing from 15 to 25 pounds, usually; and he's about 30 inches long and with a short six-inch tail which looks larger because of the spines. When he walks he sounds like a quiver of arrows rattling.

He lives a quiet, lazy life. Unless food becomes scarce he's a home-body

who dislikes travel. Give him a fat hemlock tree where he can settle in some comfortable fork and eat twigs until his sides are the shape of barrel staves, and he's happy. He loves twigs and loves bark.

I know a section along Bushkill Creek in the Poconos that is a pet porcupine hangout. You see there how the rat-like teeth have been barking the trees. Owners of this land have been bristling and are talking about routing these greedy tenants, and this will be possible as porkies have no protection under Pennsylvania Game Laws. In the North country it's unlawful to kill a porky. Up there, the animal is considered valuable because he moves slowly and is easily killed by an unarmed man lost in the woods.

You can eat a porky if you must, but his flesh is leathery and wild-tasting.

If there is anything a porky loves better than fresh twigs for his stomach, that food is salt. You've heard tales of him lumbering, quills rattling, into a mountain camp— attracted by salt. If you've been using the axe and doing some sweating, porky will eat the axe handle, even if it's the toughest hickory. Likewise, he'll chew up the canoe paddles. And if there just happens to be dynamite in camp, that's his favorite dessert. Many lumber camps have reported a porcupine eating the camp supply of explosives—without apparent ill effects. . . .

Porky likes to complain to himself. While eating bark or twigs he often mutters low squeaks, moans and grunts, which gives him the name of "quill pig."

And like a loon, a porky takes crazy spells. He'll sit high in a tree, with no particular reason for complaining, and let out a long and melancholy wail. He'll give out this sound at intervals. If you aren't familiar with the sound, it is frightening. But porky isn't mad at anybody,

and he isn't a hunter on the prowl—he's just odd as a three dollar bill.

Baby porkies are larger than the new born cubs of the Pennsylvania black bear. Consider a mother porcupine, a maximum of thirty inches long; then think of delivery of an infant eleven inches long. And remember that the baby comes equipped with quills one-half inch long.

Yes, the porcupine is an odd character. If you disturb him in the forest he'll likely stare numbly at you, for a porky looks at life with an indolent, disinterested, stupid expression; he isn't likely to run. A instant later he'll climb a tree and begin chewing twigs, your intrusion forgotten.

He's a fellow without a grudge yet there isn't an animal in our Pennsylvania forests, and remember the black bear is on this list, who will conquer a porcupine. Naturalists agree that one mighty slap of a porcupine's tail will drive away a bear, Foxes, wildcats, and in the North country wolves, have been found dead in the wilderness, killed by porcupine quills. Last year I saw a raccoon trapped here in the Poconos with face plastered full of porcupine quills. Let's take a look at those quills, for they are wicked stilettos.

Porky's quills are hollow, as sharp as needles, and covered with many minute barbs. The quills are of different lengths on different parts of the body and are loosely held by porky, so that slightest contact releases them. Porky does not throw these quills but sometimes, when he whips his tail in anger, they fly out and in this way I have seen them catch on man's pants-leg five feet away. The quills are hard to pull out because of the barbs, which swell up after entering warm, moist flesh and which because of their slant, work deeper into a victim's body.

You would think porky was impregnable—and he would be, except for two weaknesses. His weaknesses

the tip of his nose and his belly. A sharp rap on porky's nose will kill him instantly. Also, his underbelly has no quills and is sparsely covered with hair, as a skunk's belly. So when porky sees danger he flicks his nose underneath and puffs up into a great, bristling ball. If a fight comes, he turns his head from the opponent and *backs* into the fray. One swift flip of the tail and his enemy is injected with fifteen or twenty needles that are almost unbearably painful.

If Pal, a neighbor's dog, could speak, he'd tell you about those quills. Recently that neighbor came to the house and angrily tossed a bundle of porks quills on my kitchen table. "Come on up and help me out," he said. "Pal's got mixed up with one of these darned things."

"Another one," was my surprised comment. "Second one in a couple months' time."

Then I listened to the neighbor's story.

"I was down locking up the barn and had Pal along. It was pretty dark when we reached our creek ridge, and just like he was lighting out after a cat Pal jumps into the brush and you should have heard the awful fuss. It was the darndest most peculiar rattling.

"I was helpless without a flashlight so I ran back to the house, and good night! What a sight that was in the brush. First of all I saw the long dark quills and knew right off what it was. Then and there I had fears for Pal's safety, but I knew I was

helpless too, because Pal and that porky were just too mixed up for me to do anything.

"I'll say this for Pal—he sure can take it. His face was stuck full of quills yet he never let out a sound. And talk about mad! Pal had his face sunk right into those quills and had the porky by the throat."

"Whew!" I said, sickened at the thought. "He kill the porky?"

The neighbor nodded. "But I don't know about Pal, either. I never saw such a mess."

I went along back to the neighbor's house and he hadn't exaggerated—Pal was a living pin-cushion. They took the dog to a Stroudsburg veterinarian, who injected morphine and proceeded to pull five hundred quills (the doctor's estimate) from body, head, inside of the throat, lips, tongue, but luckily not the eyes. You'll be happy to know Pal is alive today, but his bark is a bit raspy and occasionally quills appear under his heavy brown hair.

But the thought came to me: How an animal of the forest, unable to get help, must suffer after an encounter with porky.

He's a bad one to bully around, is porky. But he isn't looking for trouble. He'd rather sit in a comfortable tree crotch, gnawing twigs, pausing occasionally to let out that crazy war-whoop of his.

To my thinking, there's no more odd character in the forest than a porcupine. He's as odd as a three dollar bill.

. . . *The End*

The ocelot gets its name from the Latin ocellus, meaning a small eye. This refers to the animal's being marked with small spots or "eyes."

\* \* \*

The pupil of the dolphin's eye is heart-shaped.

\* \* \*

Fresh water fish and sharks do not drink water. Other fish do.

\* \* \*

The only two poisonous lizards in America are the gila monster of New Mexico and Arizona, and the beaded lizard of Mexico and Central America.

\* \* \*



## Return to Slow Crick

By Carsten Ahrens

IT WAS a dangerous thing to do . . . even foolhardy to think about. I hadn't been back to the Slow Crick Country in a score of years. It would be psychologically unwise. I had loved the area too well to risk the disillusion of return. The places where I had worked and (more importantly) played as a boy were still so vivid in my mind that when my own children came along, I told them all about the fabulous land where I grew up. They took many a mental journey back into what they regarded as daddy's never-never-land.

They had always been interested in that strange person daddy must have been as a boy. Just imagine daddy running around without glasses, shoes, stockings, pipe, and mustache! And imagine daddy's living anywhere except in the city. They never

had. This place he called "Slow Crick Country" was as real to the as *Wonderland* was to Alice, *Oz* w to the Wizard, or *Treasure Island* was to Jim Hawkins.

Through the years we had made a map of the Slow Crick Country and before prayers at bed-time we often visited that magic land. Each time we "went" we labelled new places and spots of interest on the map. There were the log bridge, the bee tree, the dog-tooth violet bed, and the patch of dutchman's britches. There, too, were the wild raspberry patch, the shagbark hickory grove, the line of black walnut trees along the lane, and the yellow transparent apple trees. The spots were marked where the spring and autumn music rooms could be found, where the green plums ripened, where the black

erry trees made one long for June, and where the red mulberry trees drew as well as all the birds in the neighborhood. We had marked the swimming hole, the best fishing spots, and the places where daddy trapped muskrats and where he trapped skunks. I've often wondered about that. One winter while we were in high school, my brother and I trapped, skinned, and stretched ever so many skunks. Yet we didn't miss a day of school, and no one complained about objectionable odors. Maybe in the rural community of yesterday, the factory nerves were much less sensitive.

But I've gotten off the subject. This began last summer when vacation time came around, and my wife said, ". . . and since our house is finally paid for, I make a motion that we go on a vacation."

We were having a family business meeting.

"You have heard the motion," said "do I hear a second?"

Everybody seconded it.

"Where shall we go?" I asked.

For a moment there was silence. Then my wife said, "I move you take to the Slow Crick Country where you grew up."

"Why," I replied, "I couldn't do that. It's probably all changed. The swamp lands are probably all drained, and the French Canadian loggers and their mysterious cabins will have disappeared. The children of the German farmers will have filling stations and overnight cabins here once their neat truck farms were wedged between the swamp and the holdings of the longer established and more conservative general farms. I wouldn't think . . ."

"There is a motion before the house," my spouse remarked.

"You have heard the motion," I started to say.

Everyone seconded it, and that is how it came about that we returned

last summer to the Slow Crick Country.

So we went back. When we came within twenty-five miles of our destination, places began to take on a familiar look, and from that point in, I sounded like the ballyhoo man on a conducted tour.

Most of my predictions came true. We stayed in a tourist camp whose proprietress was the daughter of one of the truck farmers. The attractive cabins were arranged in a neat semi-circle upon the black muck that once produced prodigious crops of onions and celery.

And Slow Crick? It wasn't even called "crick" anymore; it had become "creek." The word "slow" had been replaced by the name of a local hero who had performed amazing feats of valour in the South Pacific during World War II.

Time was when pastures with fine herds of dairy cattle ran down to the water's edge. Now, either the banks of the stream were lower (I may have grown taller), or the water was much higher. The pastures on either side of the banks were now filled with bull rushes that stood columnly while their reeds gossiped around them.

We dug worms where years before I had dug worms. We got bamboo poles and went fishing where our home-made map said fishing was unexcelled. Nothing seemed annoyed with us but a great blue heron that left the margin of the stream at our coming with a dignified but disgusted grunt.

We settled down to fishing. I did little but bait hooks for the young ones had never seen a hook . . . or a worm, before. But soon, I was the only one fishing! There were too many wonderful things going on. A muskrat was busy harvesting, washing, and storing bulbs. As it advanced through the water, it was the apex of a giant V that lengthened

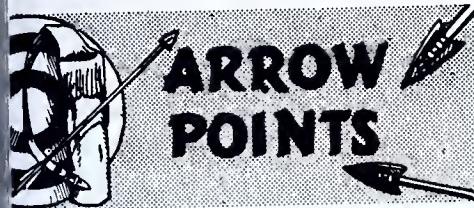
as it swam. Whirligig beetles made polka-dotted patterns on the almost motionless water. Where the current was clear, the water striders made fantastic shadows on the sandy bottom. Small dragonflies, that we used to call "amber-wings," fought for possession of the bobbers. Across the stream grew water lilies and lotuses, both beautiful, but the first were so flexible and graceful, and the second so stiff and aloof. Now and then a kingfisher went kutch-a-kutch-a-kutching along on his way to spear some unfortunate fish. Turtles crawled up on exposed spots of nearly submerged logs; probably they were more interested in ridding themselves of the parasitic leeches than they were of acquiring vitamin D. Red-wing blackbirds, splendid in their epaulets, marsh wrens, a black duck, coots, and woodcocks investigated us,

and then went on about their various businesses.

Strickly speaking, if you have four young ones, you don't take a vacation . . . you go on an extended picnic. But this one was eminently successful. Often we didn't fish . . . Fishing was just an excuse to get off the map and go exploring. At the end of two weeks we returned to the city absolutely sure that our fishing vacation was the best that any one could have taken. It worked a little too well: Junior couldn't see much sense in living in a crowded, dirty city when one could live along the St. Crick where the air was pure, the water tasted like water, etc. But I hope to civilize him again.

You might try it next summer. If you turn to the haunts you once knew so intimately in your bare-foot days. If you do, I hope you find your crick as unspoiled as mine.





# The Bow

## *Types — Materials — And Characteristics*

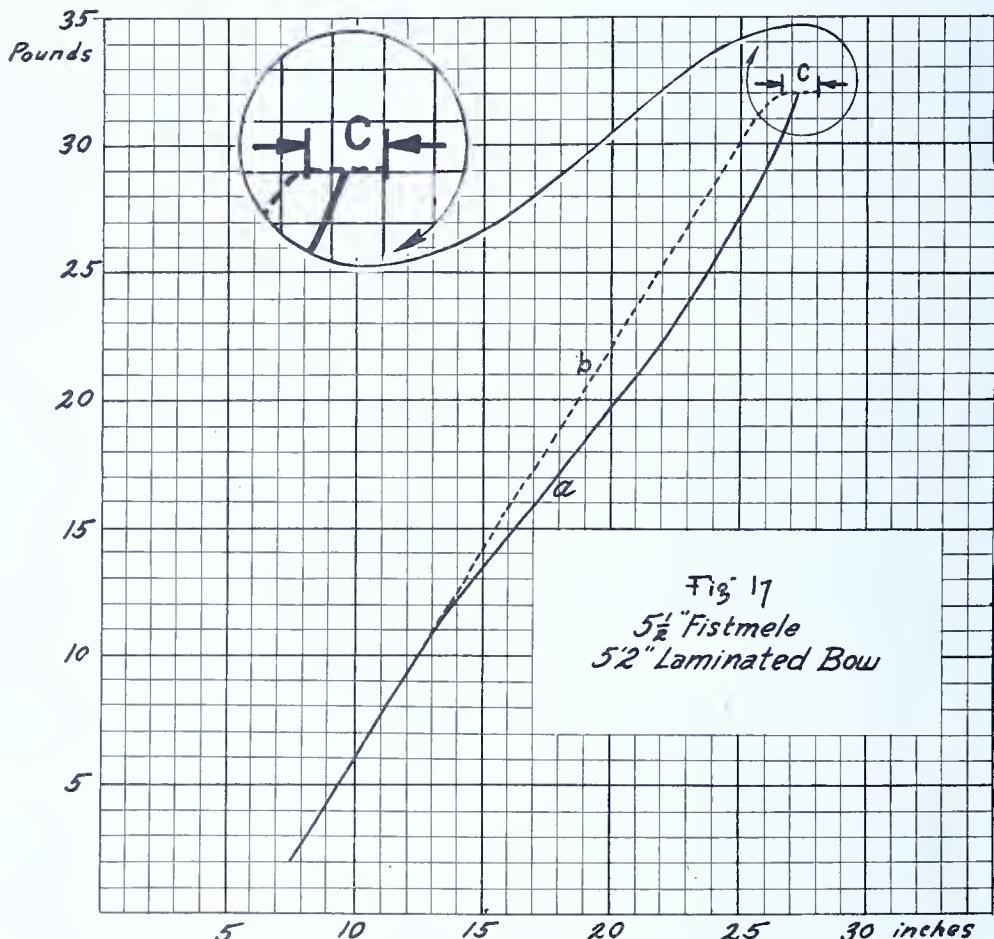
By Thomas A. Forbes

### PART 3

WE have reviewed the ultimate strength of materials briefly and noted that rupture incurs when the stress or load exceeds a certain amount. Experiments show that a piece may be ruptured by repeated applications of a load much less than this and the oftener the load is applied the less it need to be to produce rupture. The sum of the maximum tension and maximum compression in a bow which is subjected alternately to tension and compression is called the range of stress in the bow. For a given number of applications, the load required for rupture is less when the range of the stress is greatest. When, as in the bow, the stress is alternately tension and compression, rupture takes place more readily than if it is always tension or always compression. That is, it takes place with a less range of stresses applied a given number of times, or with a less number of applications of a given range of stress. For a given number of applications, the most unfavorable condition is where the tension and compression are equal. Rest between stresses increases the resisting power of a piece of material which is the reason the bow should be always unbraced when not in use and the fistmele checked occasionally when used for long periods. The main spring in your watch finally breaks due to the fatigue of metal. This slow deterioration is progressive and can account for the spring in the old car breaking when you hit one bump too many although not necessarily a hard one. Theoretically

a metal bow should let down at the yield point rather than break when the bow is stressed or drawn beyond its elastic limit.

So much for theory. In practice no two molds of steel can be exactly alike nor can the finished product be absolutely free of imperfections. So although widely acclaimed by the manufacturers metal and metal alloys like all other materials have their limitations in the manufacture of bows. Metal bows generally are light in weight. They have an excellent cast and consequently a flat trajectory which can generally be said to exceed that of a wooden self bow with the same drawing weight. A flat trajectory is a decided asset in wooded areas when hunting game. The game may be in plain sight but frequently the vertical clearance in the line of flight is insufficient to deliver an arrow to the mark. For this sole reason a good case can be built for the heavy drawing weight of a bow used for hunting. Archers are divided in their opinions as to whether the metal bows are as smooth shooting as some of the laminated and self wooden bows. Some metal bows have an advantage that they can be taken apart at the handle which reduces the problem of transportation. One model known to the author has an adjustable lower limb. Limbs are replacable on the metal bows although it is the personal feeling of the author that replacing one of the limbs of a metal bow would give results about equal to the old practice of replacing a single



broken leaf in an automobile spring, now long discontinued.

#### The Center Shot Bow

Since the arrow passes on the left side of the bow and the string returns to the middle it would appear that the arrow should fly far to the left. Actually well made arrows are spined for a particular drawing weight. By spine we mean the quality of stiffness and resiliency of an arrow. Properly spined an arrow actually bends around the bow in flight and oscillates as it flies toward the target. During this change of direction the arrow loses some of its initial velocity. Dr. Clarence N. Hickman propounded the proposition that the arrow should be shot from a point nearer or at the center of the bow rather than from the side. With such

a bow the arrow would leave the bow in a straight line and thus lose none of its initial velocity through oscillation. Too, a bow of this design would permit the use of lighter arrows and there would be less chance of breakage from bending at the bow in flight. Consequently increased distance and a flatter trajectory would be achieved without an increase in the drawing weight. With these ideas in mind Dr. Hickman designed the center shot bow, Figure 18. This bow in its simplest form is reduced in width in the vicinity of the arrow plate by cutting out a section on the left side of the bow. The reduction in the amount of material at the section is made up by increasing the thickness of the bow and the adjacent portion of the limbs are much wider than the

(Continued on Page 35)

# Wayne County

# Pennsylvania's Land of Lakes

Twentieth in a Series

*Note: This center sheet can be removed if desired, without damaging the magazine, by loosening the two center staples.*

### Land Area

The county contains 486,144 acres, which 293,866 are forested. There are 2,439 acres in farms. Publicly owned land comprises 12,299 acres, which 12,291 are State owned.

### Topography

The surface of the county is undulating, rather than mountainous, though it has some noteworthy elevations. 110 lakes dot the county. One of these is Lake Wallenpaupack, second largest lake in the State, which is three miles wide and fourteen miles long. The county is drained by numerous small streams, chief of which are the Lackawanna, Middle, Lackawaxen, and Wallenpaupack Creeks.

### Transportation

Railroad transportation is furnished by the Erie, the New York, Ontario & Western, and the Delaware & Hudson. The Roosevelt Highway (U. S. 6) and other important routes traverse the county, which has 504 miles of improved State highways.

### District Game Protector

T. T. Schafer, R. D., Honesdale, has jurisdiction over Scott, Preston, Buckingham, Manchester, Mount Pleasant, Lebanon and Damascus townships.

Robert H. Myers, 609 High St., Honesdale, has jurisdiction over Clin-

ton, Dyberry, Oregon, Canaan, South Canaan, Texas, Berlin, Palmyra, Lake, Paupack, Salem, Sterling, Lehigh and Dreher townships.

### Fish Warden

LeRoy Noll, Mount Pleasant.

### Agriculture

Most of the cleared land in the county is devoted to dairying. Poultry is also an important agricultural product.

### Industry

The principal classes of industry are textiles and textile products, leather and rubber goods, lumber and its remanufacture. Chief products are underwear, grist mill products, bobbins, spools, furniture, lumber, knit goods and shoes.

### Historic

From the time of Braddock's defeat in 1775 the settlers of the region were harassed by Indians. Resident Indians complained bitterly to the governor of Pennsylvania about the settlements of the Connecticut Yankees, who had bought the land from Indians with a doubtful claim to the territory.

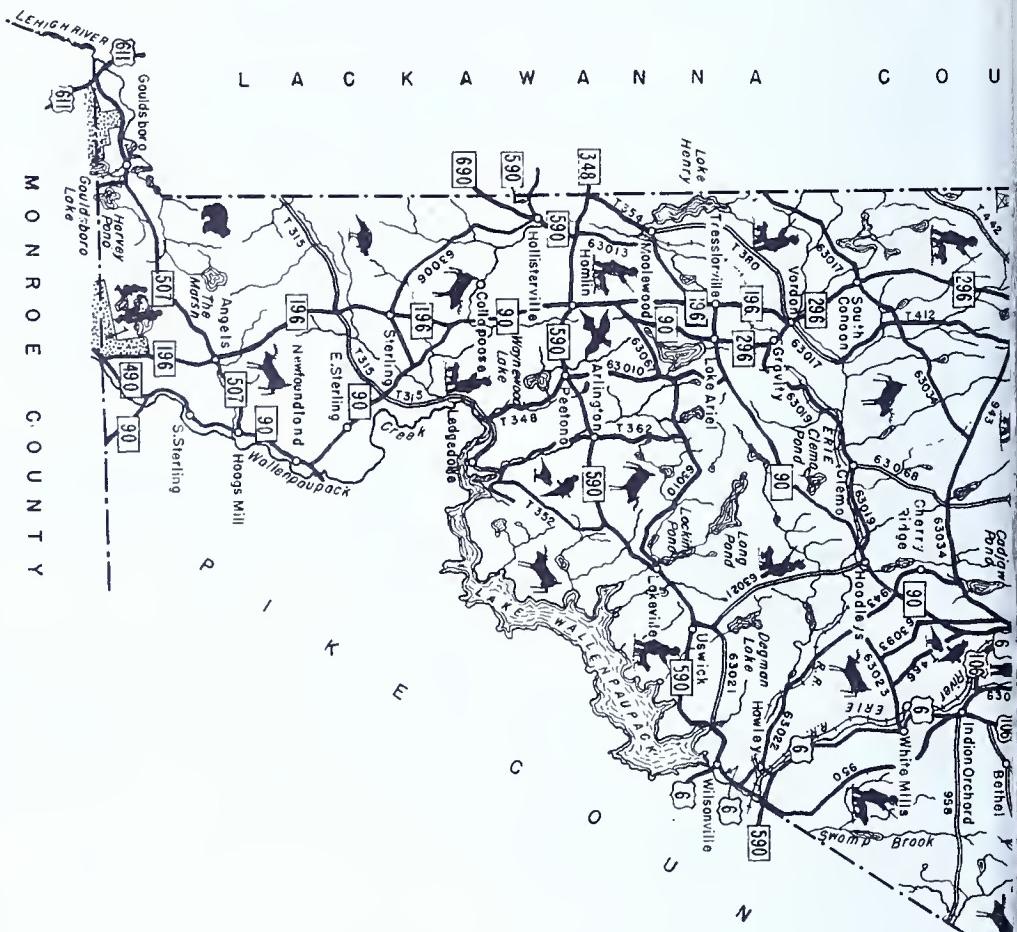
This northeastern section of Penn's colony was claimed by Connecticut, New York and Pennsylvania, and between the years of 1748 and 1769 the proprietaries surveyed more manors in this area than in any other outlying section. Probably this was done as a protection against conflicting claims of other colonies.

Cushetunk (now Milansville) was a settlement of the Connecticut-Delaware Land Company. Pennsylvania's governor sent spies—justices of the peace disguised as settlers—to deter-

L A C K A W A N N A

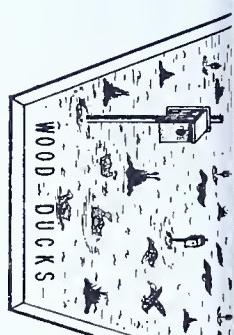
C O U

MONROE COUNTY



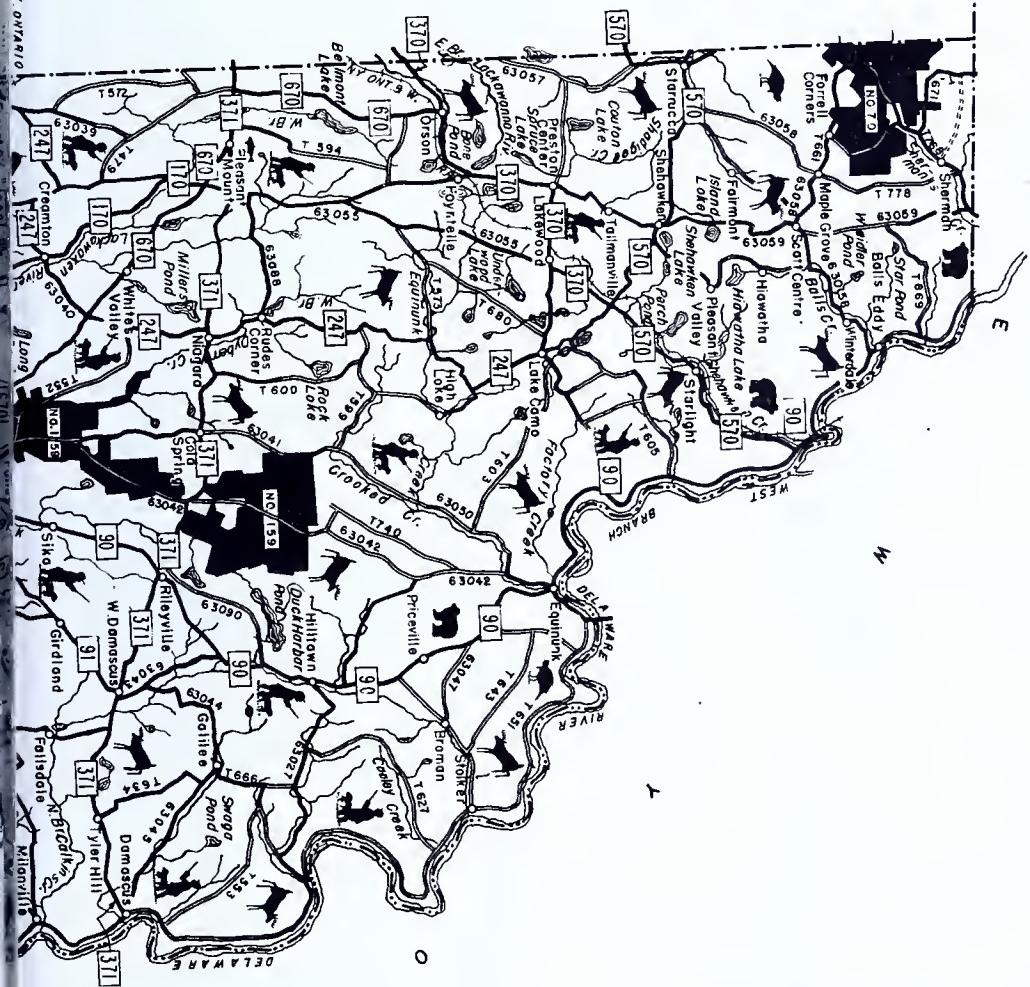
PENNSYLVANIA  
GAME COMMISSION  
WAYNE  
COUNTY  
PENNSYLVANIA

Scole in miles



S U S Q U E H A N N A C O U N T Y

N



... K E Y ...

(◎) - County Seat.

- Farm-Game Project.  
(Open to hunting)

- State Forest Fire  
Observation Tower

- Game Protector's  
Headquarters,

- Game Propagation Aren.  
Bear Hunting,

- Deer Hunting,

- Wild Turkey/  
Hunting.

Grouse,  
Pheasant,  
Rabbit &  
Squirrel.

- Small Game  
Hunting.

- Railroad.

- Stream.

- State Forest Land.

■ - State Game Land.

● - State Park.

▲ - State Fish Hatchery.

— 90 - Pennsylvania Route Number.

— 106 - U. S. Highway Route Number.

— 53042 - Legislative Route Number.

— Township Route. (T-599)

mine the size of the community and three times ordered the settlers to depart. Some of them withdrew at the time of the Wyoming Valley massacre but returned as did many other Connecticut settlers whose individual land claims were finally recognized under Pennsylvania law.

James Wilson, signer of the Declaration of Independence and Judge of the United States Supreme Court owned large tracts of land in Wayne county and built a flax mill at Wilsonville in 1792.

In the early days of the anthracite industry plans were developed to ship coal to Philadelphia by way of the Lackawaxen and Delaware rivers. This plan was not successful. The coal was then drawn over the old Connecticut road to what is now Hawley, then transferred to arks. This proved too expensive. Later a road was built from the county line to what is now Honesdale, but this venture, too, proved unprofitable. Finally, the Delaware and Hudson canal, which gained control of both the canal and the coal industry. In the days that followed Honesdale became the world's largest coal storage center where millions of tons of anthracite were stored for shipment. During the winter the coal was brought 16 miles from Carbondale to Honesdale by the old gravity railroad, stored there until spring, then reshipped by canal boats to tidewater. One of these locomotives, the English-built *Stourbridge Lion*, was the first locomotive to run on a track in America.

One of the country's most famous citizens was David Wilmot, legislator and author of the Wilmot Proviso. This proviso stipulated that slavery should be prohibited in any new United States Territory. The Wilmot Proviso, incidentally, was indirectly responsible for the founding of the Republican party. When the Democrats and Whigs rejected the resolutions of the proviso in their conventions of 1846, many of its supporters

left these parties and in 1848 formed the Free Soil Party from which the Republican Party developed.

#### Recreation—Hunting

Wayne county offers good bear and deer hunting. It is one of our best grouse counties and has a better-than-average varying hare population. Duck hunting is variable—sometimes it is excellent, at other times poor. This county and Pike county are the two last important strongholds of the otter in Pennsylvania.

State Game Lands in the county and their areas follow: Number 159. Comprising 7,436 acres, a part of Number 70 comprising 3,353 acres.

#### Recreation—Fishing

Fishable waters (name of stream or lake, fish stocked, location and length or area of stock waters) include: Alder Marsh Creek, brook trout, Cold Springs, 2 mi.; Butternut Creek, brown trout, Hamlin, 4 Mi.; Calkins Creek, S. Br., brook trout, Milanville, 5 mi.; Dyberry Creek, brown & rainbow trout, Honesdale, 7 mi.; Dyberry Creek, E. Br., brook trout, Honesdale, 6 mi.; Dyberry Creek, Middle Br., brook trout, Whites Valley 1 mi.; Dyberry Creek, W. Br., brook trout, Dyberry, 6 mi.; Johnson Creek, brook trout, Pleasant Mount, 8 mi.; Lackawaxen River, W. Br., brown & rainbow trout, Pleasant Mount, 7 mi.; Lehigh River, brook trout, Gouldsboro, 4 mi.; Wallenpaupack Creek, brown & rainbow trout, Greentown, 1 mi.; Wallenpaupack Creek, W. Br., brown & rainbow trout, Hamlin, 6 mi.; Beach Lake, black bass, Beach Lake, 110 A.; Como Lake, black bass, Lake Como, 85 A.; Coxtown Lake, black bass, Starrucca, 109 A.; Delaware River, black bass, Narrowsburg, 50 mi.; Fourmile Pond, black bass, Shekawken, 70 A.; Little Hickory Lake, black bass, Poyntelle, 52 A.; Keens Pond, black bass, Waymart, 86 A.; Sly Lake, black bass, Sly Lake, 52 A.; Upper Woods Pond, black bass, Cold Springs, 75 A.

(Continued from page 30)

limbs of the conventional types of bows. The bow is a bizarre looking affair but it shoots smoothly and well. It has been manufactured and marketed in recurved and reflexed models and Dr. Hickman has had excellent results in flight shooting with a special bow of this type.

To obtain the maximum efficiency at any drawing weight bows are designed so that at full draw the material under stress is approaching the yield point, B Figure 16 (March issue). This is true in both wood and metal bows. The expression commonly heard is that a bow at full draw is considered to be four fifths broken. Your bow should never be drawn past its proper arrow length. An added inch of draw may seriously damage or break the bow. Regardless of the excellent quality and workmanship of our modern bows they do fail on the shooting line for reasons we have discussed. A broken bow limb striking the archer around the head or face produces painful results. If your new bow is equipped with a keeper, a short piece of elastic cord attached to the loop of the bow string and to the bow near the top nocking point, to prevent the loop from sliding down the limb when the bow is unbraced, it is suggested that you remove it before using the bow as its advantages are outweighed by the possibilities that it will cause the upper limb to fly back and strike the archer if the bow should break. The number of archers on the shooting line who wear protective head gear as a precaution against injury is increasing all the time. Stiff visored caps, sun helmets, G I helmet liners etc., are all seen on the shooting line. Since the life of your bow is indeterminate reason indicates that we should take the necessary safety precautions to insure against accidents.

#### The Ideal Bow

At this point it is well to realize that the search for the ideal bow is

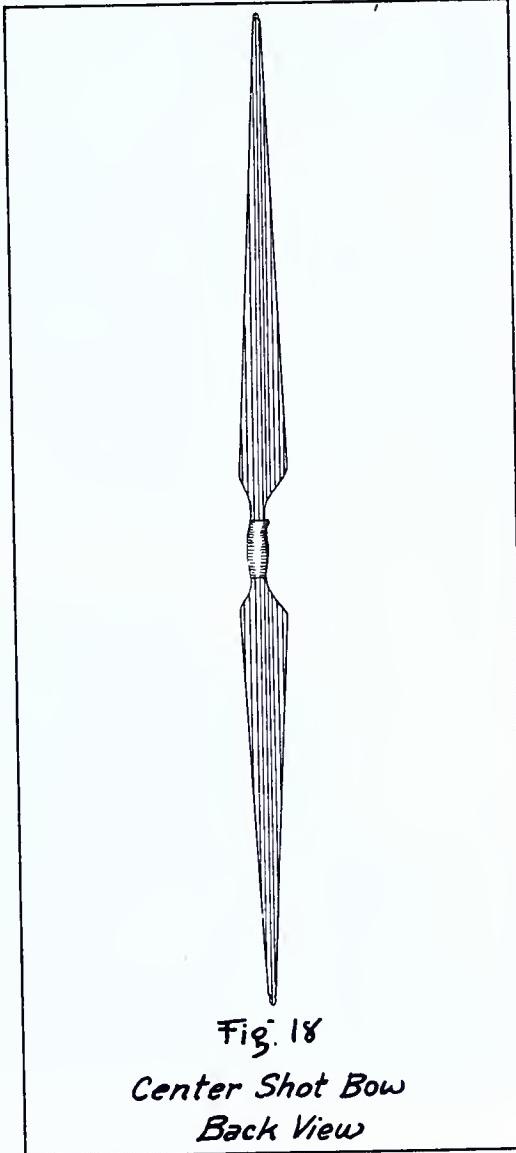


Fig. 18  
Center Shot Bow  
Back View

not a process of groping in the dark for an unknown goal. The bowyer envisions a bow that has all the attributes of the best modern bows and one additional quality. His aim is to build a bow which at or just before full draw will have a drawing weight of  $X$  pounds and will continue to draw or pull just  $X$  pounds when brought to full draw or even slightly overdrawn. The solid line (a) in figure 17 graphically represents the relation between the length of draw and the drawing weight of a modern laminated bow and the dotted line (b) represents

the curve of a bow which has a theoretically ideal draw. When we are able to attain this desired goal the archer will be able to release the arrow at any position approximating full draw with the knowledge that the arrow will be propelled by exactly the same force each time that it is released from the bow. Creep, the bane of the archer will have no effect on accuracy. Creep is the forward movement of the arrow during the interval necessary to slip the drawing fingers from the string. It is impossible to remove the fingers instantly from the bow string and

consequently some variable amount of the propelling force that has been built up in the bow during the draw is lost each time the string slips through the fingers during the release. The rifleman is not confronted with this problem. Regardless of the time spent in squeezing the trigger there is the same initial velocity imparted to the projectile at the instant of each discharge of the rifle because of the uniformity of the powder charge. The archer is searching for a bow that will achieve a similar result.

. . . *The End.*

#### NOTICE ON BOUNTY RATES

#### PENNSYLVANIA GAME COMMISSION

(Excerpt from Official Minutes, Pennsylvania Game Commission Meeting, January 10, 1952)

#### RESOLUTION

WHEREAS, After giving due consideration to the present predator population;

THEREFORE, BE IT RESOLVED, That the Pennsylvania Game Commission, acting under the power and authority vested in it by the provisions of Article XI, Section 1101, of the Game Law, by resolution adopted this 10th day of January, 1952, hereby directs that for the period beginning June 1, 1952 and until further notice, the bounty payments authorized for the birds and animals enumerated below, if killed in a wild state in any County of the Commonwealth during the period specified and presented in the manner and under the conditions stipulated in the Act aforesaid, shall be as follows:

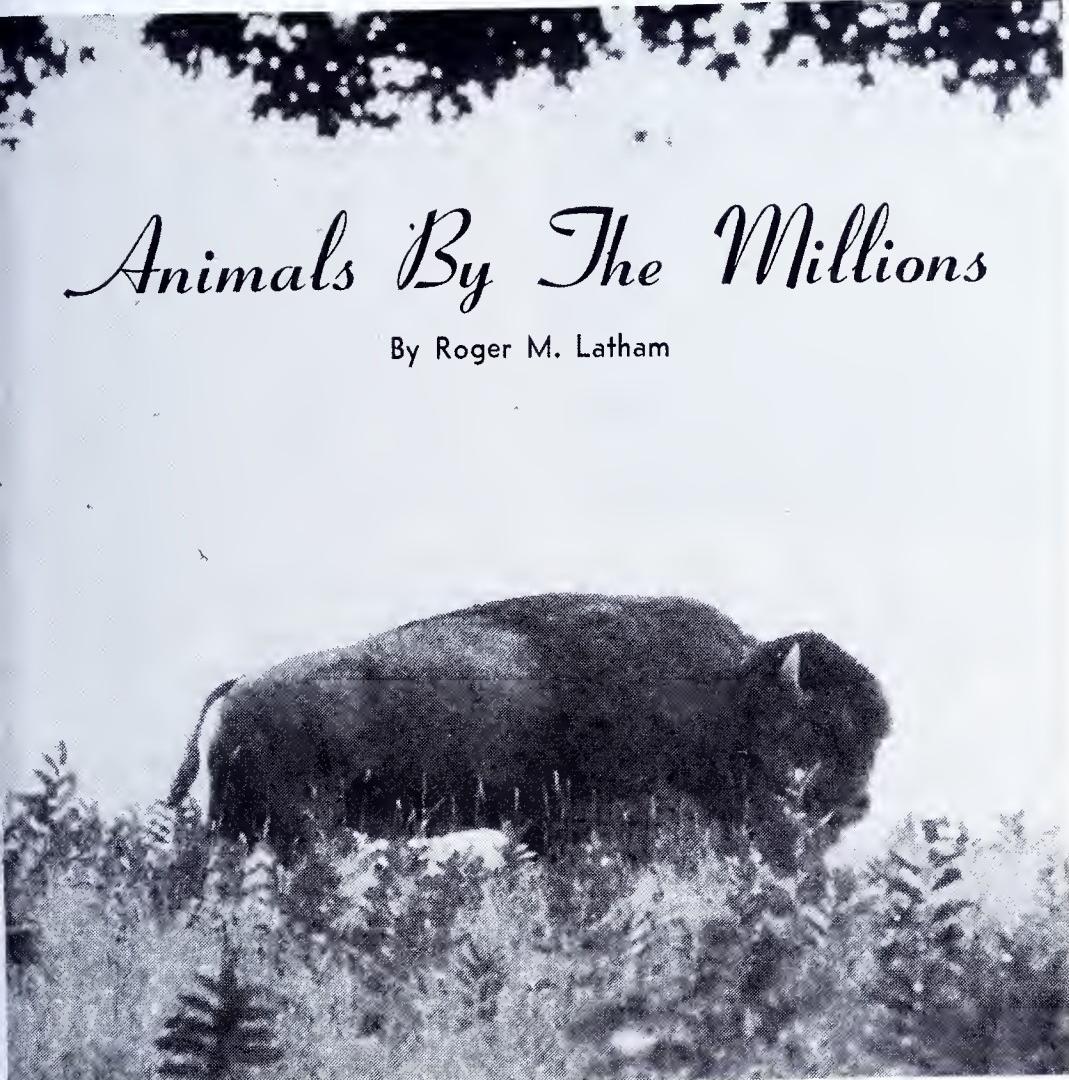
1. *Gray Fox*—\$4.00 for each gray fox.
2. *Red Fox*—\$4.00 for each red fox.
3. *Weasel*—\$1.00 for each weasel.
4. *Great-horned Owl*—\$5.00 for each great-horned owl, adult or fledgling.

BE IT FURTHER RESOLVED, That the foregoing resolution shall be duly published in accordance with Section 1102 of Article XI of the Act aforesaid in the March and April issues of the PENNSYLVANIA GAME NEWS, also to be brought to the attention of the public by news release and other sources of public information; and

BE IT FURTHER RESOLVED, That the Executive Director is hereby authorized and directed to certify the foregoing as an act of the Pennsylvania Game Commission.

"I hereby certify the above to be a full, true and correct copy of the resolution establishing bounties on certain predators killed in a wild state within the Commonwealth from June 1, 1952 until further notice. Notice of this action is published in accordance with the requirement of the law."

Thos. D. Frye,  
Executive Director  
Pennsylvania Game Commission



# Animals By The Millions

By Roger M. Latham

PGC Photo

*At one time bison lived in our country in unbelievable numbers.*

EVERY outdoorsman or nature lover, at some time or another, has dreamed of the great herds of game animals or the immense numbers of birds which existed in this country within the past two hundred years, and wishes longingly that he could have been privileged to see these examples of Nature's unbounded fruitfulness. Or, they may think of the vast numbers of animals which still exist today and dream of having the opportunity to observe these awesome spectacles. But for

most people this can be only a dream, because the parts of the world where animals can still be seen in tremendous numbers are out of the financial bounds of most men.

But there are few who are not fascinated by vivid descriptions of fabulous hordes of animals. And these stories are not all historical in nature. Many could be written this year or fifty years in the future. There are still enormous numbers of animals on this old earth.

Of course if all animal life, in-

cluding those too small to be seen without the aid of a microscope, insects, and other small forms, are considered, most people have no conception of the prodigious numbers in which they occur. The story is told of two boys who were sent into a woods during mid-summer and told to count all of the different kinds of animals they saw. A half hour later they returned and reported seeing two birds and a few spiders and flies. When asked how many kinds of animals they thought might be living in the woods, they guessed "twenty" and "a hundred." Actually there were probably over 10,000 different kinds in the small woodlot.

Everyone has read of the locust migrations of Africa and Asia when the sun may be blotted out by the immense swarms of these grasshoppers. There are many other less well known examples. In Switzerland railroad trains were held up by literally billions of springtails, tiny insects one-twentieth of an inch long, which so covered the rails that the wheels could get no traction. A sudden infestation of tiny water fleas in the Antwerp, Belgium, reservoirs made it necessary for six men to work night and day removing these insects. An estimated ten tons were removed before they were brought under control. In one acre of arable land there may be 800,000 earthworms and several millions of other small animals. If all of the descendants of one pair of house flies lived, within five months the entire surface of the earth would be covered to a depth of forty-seven feet!

But we want to talk mostly about larger animals—the more spectacular instances of great abundance. There are numerous examples of mouse plagues. The first serious one in the United States occurred in Nevada in 1907. Field mice reached an abundance of 8,000 to 12,000 per acre and destroyed 15,000 acres of alfalfa before the plague died down. It was

estimated that about 3,000 birds of prey and various carnivorous mammals which had been attracted to the area were killing about one million mice every month.

In California in 1926, house mice reached an unprecedented peak of 82,000 of these animals to the acre (17 to the square yard), and observers computed that one grain bin twenty feet square held nearly 4,000 mice at one time. Two tons of these mice were killed in one day around a granary. Trenches dug to stop the animals collected about 85,000 to the mile. Even penned sheep were killed and eaten by these ravenous pests. During the Australian mouse plague of 1917, over 70,000 were killed in one stockyard in an afternoon, and one farmer who put poisoned meat inside his house picked up 28,000 on his porch the next morning and only stopped then because he said "he was tired." At Lascelles three tons, believed to be about 200,000 mice, were taken in one night, and within about three months 544 tons or an estimated 32,000,000 had been killed.

An interesting story is told of a schooner being run ashore on the coast of Tristan de Cunha, a remote island in the South Atlantic. Some of the ship rats escaped to the land and within a short time had increased to such an extent that they were attacking and killing the wild rabbits on the island. The inhabitants, hoping to rid the island of rats, introduced a number of cats. But, instead of the cats eating the rats, the rats ate the cats.

The greatly publicized lemming migrations in Norway and Sweden are depicted as occurring in giant undulating waves of animals marching shoulder to shoulder and literally covering the terrain for miles. However, this is a highly exaggerated description of the true migration. It is a fact that hundreds of thousands, and probably millions, of these ani-

nals resembling miniature guinea pigs march from the high mountain country to the sea and unhesitatingly plunge into it. But, they travel as individuals and mostly at night, so that the actual migration is more of a filtering movement. Occasionally, however, they may congregate in considerable numbers. In 1868, so many swam into Trondhjem Fjord that it took a steamer a quarter of an hour to pass through them. Most of these which enter the ocean drown, unless they are able to reach islands off the coast, and the beaches at times are piled high with dead bodies.

From insects, to mice, to rabbits, and first the snowshoe hare. The snowshoe which lives in northern United States and throughout most of Canada, is noted for its ten-year cycle. That is, every ten years it builds up to peak numbers and then "crashes" to a mere remnant of its former numbers, and begins the building-up process all over again. Many writers, from earliest times to the present, have given descriptive accounts of the immense numbers of snowshoe rabbits which are occasionally found. One tells of a visit to Alberta in 1912: "The place was infested. I do not hesitate to say that over that tract of perhaps thirty acres hundreds of hares were found. October had come without snow. The rabbits had already, wholly or in part, donned their snow-white livery of winter, and were consequently very conspicuous against the mellow brown of the autumn woods. At every turn during my ramble, they popped up here and there and scurried for fresh cover."

Estimates of from 3,000 to 6,000 snowshoes to the square mile are common, and there is one record of an estimated 10,000 on one and a half acres. Of course, this concentration was unique, but it does reflect the prodigious numbers which rabbits can attain.

The jackrabbits of the West at



times become unbelievably abundant even yet. The jackrabbit drives of fifty or seventy-five years ago would often net tens of thousands at one time.

By far the best rabbit stories come from Australia and New Zealand. In both places the European hare was introduced and increased and spread to such an extent that they almost became a national catastrophe. In New Zealand they multiplied so fast that the grass was destroyed over wide areas and many thousands of sheep died of starvation. In Australia, the rabbit "plague" almost eliminated agriculture and livestock raising in many regions. There were millions of these animals to eat everything that man planted, and everything that nature had provided for his sheep and cattle. The control of rabbits became a major function of the government.

The muskrat is another which appears in tremendous numbers in some places. Louisiana, alone, produces as many as 8,000,000 or more pelts in a single year. On some of the tidal marshes, it is almost possible to step from one muskrat house to another over hundreds of acres.

Before talking about the larger animals, let's have a look at the birds. Even today, after more than

a century of persecution, you can still see a million ducks in a single day in places in the United States. The Bear River Migratory Bird Refuge in Utah boasts of the millions which use the sanctuary during the fall migration, and there are other places where this is true. The Illinois River, the Chesapeake Bay Region, the Gulf Coast, and others are noted for their vast concentrations of ducks and geese. Even greater numbers occur in other parts of the world.

Along the White Nile in Northern Africa, there are probably more water birds, in infinite variety, than in any other place in the world. For days you can sail past literally millions of storks, herons, pelicans, cranes, spoonbills, darters, cormorants, ibises, gulls, terns, ducks, geese, godwits, curlews, and many, many others. The banks, islands, and mud-flats are regularly completely carpeted with these birds. It is almost impossible to estimate the millions of birds which occupy this region, but it is one of the richest faunal areas known and certainly one of the seven "biological wonders of the world."

Far away from the Tropics in the Arctic and Antarctic, birds are sometimes found in great numbers also, but far fewer species are represented. In the Arctic, one author describes a breeding colony of guillemots, which are about the size of a small duck, in these words: "The writer is thinking of one cliff in particular on which the birds could be seen sitting perched close together on every ledge of rock up to a height of a thousand feet or more. When a gun was fired a few odd hundred thousand or million birds would fly off in alarm, without noticeably affecting the numbers still to be seen on the cliff."

The Adelie penguin rookeries of the Antarctic are just as impressive. These flightless birds spread over the ground and do not occupy cliffs as

the guillemots do. The same writer says of these: "Imagine several million short gentlemen in dress clothe (tails) standing about in a dense crowd covering several square mile of otherwise barren country. Viewed from a height they look like grave spread uniformly over the land, with dark patches at intervals to mark the areas of tussock grass, which stand out as islands in the general ocean of penguins."

The unbelievable flights of the passenger pigeon are now only history, but the descriptions of the almost endless clouds of these game birds passing overhead cause a feeling of deep regret in the minds of most outdoorsmen. From billions to nothing in a few short years, another example of man's destructive powers.

A description of their former numbers was written about 1860 by an observer near Niagara: "Early in the morning I was apprised by my servant that an extraordinary flock of birds was passing over, such as he had never seen before. Hurrying out and ascending the grassy ramparts, I was perfectly amazed to behold the air filled, the sun obscured by millions of pigeons, not hovering about but darting onwards in a straight line with arrowy flight, in a vast mass a mile or more in breadth, and stretching before and behind as far as the eye could reach.

"Swiftly and steadily the column passed over with a rushing sound, and for hours continued in undiminished myriads advancing over the American forests in the eastern horizon, as the myriads that had passed were lost in the western sky.

"It was late in the afternoon before any decrease in the mass was perceptible, but they became gradually less dense as the day drew to a close. At sunset the detached flocks bringing up the rear began to settle in the forest on the Lake-road, and in such numbers as to break down branches from the trees.

"The duration of this flight being about fourteen hours, viz. from four m. to six p. m., the column could not have been less than three hundred miles in length, with an average readath, as before stated, of one mile."

The annual harvest of passenger pigeons probably ran into many millions each year. They were shot, netted, trapped, stolen from the nests, and killed in every other conceivable manner. They were eaten throughout the year, and whole barrels of their dressed carcasses would be salted for the winter use of a family. Other thousands were shot for sport and competition at "pigeon hoots" where the birds were released from traps and shot by the competing sportsmen. They were even used as food for dogs and swine.

Market hunting was a flourishing business. In 1869 a single town in Michigan marketed 15,840,000 birds in two years, while another town sold 1,880,000 in forty days.

Bobwhite quail were also numerous in earlier days. The markets in Pennsylvania were selling live bobwhites or as little as a cent a piece as late as 1830. In Harrisburg about 1840, strings of hundreds of quail were hanging in the markets and were selling at twenty-five cents a dozen, and live birds in crates along the streets were about the same price. In Philadelphia between 1855 and 1875, quail were still only fifty cents a dozen and readily available. In 1852 quail were selling at twenty-five cents a dozen in Milwaukee and at thirty-nine cents a dozen at Janesville, Wisconsin.

Bobwhites were so abundant near Milwaukee about 1850 that they were often used instead of wild pigeons for trap shooting. During the season of 1854-55, twelve tons, or 55,000 birds, were shipped from Beloit alone. Another single shipment of 20,000 quail was sent to the Philadelphia market from Janesville.

Slaves in Maryland complained that they were fed quail so often they got sick.

Other birds occur or have occurred in vast numbers, too, but now let's talk about the big game animals of the past and present.

The stories of the bison or buffalo in the United States have been told innumerable times, but they seem to have an everlasting fascination. In 1801, Alexander Henry wrote in his journal: "The ground was covered at every point of the compass, as far as the eye could reach, and every animal was in motion." Trains would sometimes be held up for hours while great herds moved across the tracks. Tens of thousands were slaughtered for their tongues alone, and the half ton or more of fine meat and the hide were left to rot.

Only a few years ago (1937) a biologist described a migration of barren ground caribou in northern Canada: "Caribou were streaming over the distant hills, to the limits of vision. The whole land on the north side of the river was full of caribou in large and small herds, some milling, some grazing peacefully, and some running in files. We counted several thousand in herds a few hundred yards away across the river, and by counting the number of similar groups made an estimate of 20,000 as the minimum of those in sight at one time."

Another wildlife biologist who studied the Alaska-Yukon herds, reported a migration in 1935 which indicates the tremendous numbers which may move about as a single unit: "The southeast migration of the herd covered a strip approximately sixty miles wide, forty miles representing the part traversed by the main body and twenty miles that covered by scattered bands. The herd took about twenty days to pass one spot." By counting the animals which passed over a one-mile strip each day, he estimated at the end of the twenty

days that almost 600,000 caribou had passed.

Here in the States, and within the past fifteen years, the numbers of whitetailed deer in both Michigan and Pennsylvania have been estimated to approach or exceed the one million mark. Other states have not been far behind. In New Zealand, a bounty is paid on deer, and hunters are hired to go out and kill them.

For truly amazing numbers of big-game animals, Africa still leads the rest of the world. Zebras may be seen in herds of 20,000 or more. One observer reported seeing a band of zebras in close formation which extended for over two miles.

The small antelope called the springbok or springbuck were the most abundant of all the hoofed animals in Africa. One man estimated that he could see a half million of these animals at one time, and the whole migrating herd occupied an area of one hundred and thirty-eight by fifteen miles. Another wrote: "One might as well endeavor to describe the mass of a mile-long sand dune by expressing the sum of its grains in cyphers, as to attempt to give the numbers of antelope forming the living wave that surged across the desert in 1892 and broke like foam against the western granite range. I have stood on an eminence some twenty-feet high, far out on the plains, and seen the absolutely level surface, as wide as the eye could reach, covered with resting springbucks, whilst from over the eastern horizon the rising columns of dust told of fresh hosts advancing."

Today we may bemoan the loss of certain animals, such as the buffalo and passenger pigeon, which formerly occurred in such abundance, or we may congratulate ourselves on having so many deer, or fur seals, or muskrats, or we may curse ourselves and our fate because there are still too many mice, house flies, and mosquitos. Man, in a few short years,

may exterminate a desirable animal which once existed by the millions and spend immense sums and great amounts of energy trying to eradicate some pest which, if anything, seems to become more and more abundant.

We still hear people lament the tragic "slaughter of the buffalo and wild pigeon" as a national disgrace. In a sense this is true, for it certainly demonstrated man's greed and short-sightedness, but whether they were slaughtered or not, the end result would probably have been the same. Where today could we hold and feed 30,000,000 buffalos? Where, indeed, could we graze 5,000,000? The present remnant of buffalo so carefully guarded and preserved in the West are capable of increasing to its former millions if given the room and the opportunity. But each year, even these small bands must be thinned down because there is no place for expansion. In other words right now we have as many buffalo as we can maintain without interfering with the cattle and sheep industries or agriculture in general. Does it matter much after all how these tremendous herds were reduced, since their reduction was inevitable?

It is deeply regrettable that any animal should be exterminated, but again, in the case of the passenger pigeon, it would have been impossible to maintain this bird in its original numbers in competition with our intensive agriculture. It, too, had to be reduced greatly, and, unfortunately, it was an animal which could not stand marked reduction and still survive.

Rather than hide our faces against the wailing wall, we should be wide awake to forces which may threaten the existence of our desirable animal life in the future. It is our obligation to conserve and maintain ANIMALS BY THE MILLIONS.

. . . The End

# Outdoor Reveries

## "April Uproar"

By John H. Day

AT nightfall the wind dropped, perhaps somewhat ashamed of its prolonged violence, and the soft presence of April could be felt all about. Cold disfavor and sullen opposition had so far barred the realization, but now the struggle was over and the first soft April showers made little laughing patterings on bare twigs and brown grass. The countryman bared his cheek to the gentle rain and waved a final farewell to the passing Winter.

April showers have much more important business than the prosaic task of bringing on the flowers of May. They touch with practiced fingers the chords of all things and bring forth marvelous mood music. In the open forests the dead leaves drum a ghostly dirge while memories of sleet and deep snow, ice storm and stabbing frost march in solemn procession out of the woodland.

In the twigs above the young drops play a laughing fantasia, while in the open fields the eager showers patter a chirpy rondo—first music lessons on the grass roofs of the homes of tiny cheerful insects whose songs will make May nights merry. Pond margins set slender mists dancing to the music. Here the patterning song of the April showers is a rune of the ancient earth.

I could hear the April uproar long before I came near the broad marsh



at the head of the long reservoir. The webfoot choral society was in full-dress rehearsal for the annual Spring concert. Many new voices will join the choir in time for the May-day services, but from the din that came riding down-wind I knew that all the wood frogs and leopard frogs in the neighborhood were floating lazily about among the clumps of sedge grass, vocalizing at the tops of their tiny lungs.

In another week, if the April sun is kind, the melodious trilling of the common toad will add the prima donna touch to the ensemble. "Have you heard the blinking toad sing his solo by the river, when April nights are soft and warm, and Spring is all a-quiver?"

I headed back along the edge of the dam, drawn by that commotion in the marshes, when an unfamiliar

throaty alarm note pulled my attention into the branches overhead. There sat a transient visitor, obviously one of the warblers, and not too scary. The bird was quite actively feeding among the budding twigs, and occasionally made a pass at an insect in the air in the manner of a flycatcher.

I maneuvered for position and finally caught the stranger in the full light of the sun. The bright yellow rump instantly pinned it down as the myrtle warbler, one of the earliest migrants of the gorgeous warbler parade. That yellow patch stands out in flight just as does the white patch on the much larger and more common flicker.

I spent some time getting acquainted with this newcomer. He won't stay around long, choosing the far North as his nesting grounds. In areas where the bayberry is abundant he will sometimes spend the Winter, as he has a particular fondness for this fruit. As with many of the warbler clan, his attempts at song are hardly worth recording.

Great rafts of canvasback ducks were riding the wind-tossed waters of the reservoir. Two weeks before, when we had passed that way, the dam was still ice-locked, with only a few scattered patches of open water and nary a sign of waterfowl of any sort. In the meantime another April has come over the horizon and has opened all water routes for the wary ducks on their long trek from the Chesapeake to nesting grounds in the far North.

There is no mistaking the slope-headed canvasback when he is encountered while passing through during the Spring and Fall migrations. That white back stands out sharply no matter how poor the light. There were probably some red heads and other members of the web-footed fraternity in the fleet riding "at anchor" out there on the restless surface, but the great majority were

canvasbacks, the over-rated and generally underdone darling of the epicures.

The canvasback is a strong flier, zipping along at terrific speed when under full steam. As we watched one raft feeding on the far shallows, the birds suddenly took alarm and made a quick getaway, fairly leaping into the air. They banked and skidded about over the water in a magnificent exhibition of bullet-flying, and then braked to a splash landing well beyond gunshot range.

This duck has gained gastronomic fame through its love for the buds and roots of eel-grass, or wild celery, which is common in quiet waters throughout this area. Many a common garden variety duck has been fattened for the market on this same tenderizing menu and served up as canvasback to so-called gourmets who never knew the difference. In diving for these tid-bits, the canvasback lunges up and over in an amusing manner which takes the onlooker back through the years to small boy days in the old swimmin' hole.

The day was warm, in fact hot, for early April. We left the canvasbacks to their own devices and struck back through the hills for a look at whatever early flowers might have accepted the challenge of the season. We were mosying along a favorite pathway when a prevue of May floated across our right-of-way and drifted gaily out of sight through the undergrowth. This was the Mourning Cloak, the first butterfly of Spring, and one of the most beautiful creatures to be met with in the April woods.

This insect spends the Winter months as a full grown butterfly, finding a sheltered nook beneath loose bits of bark on a convenient tree trunk. Here it sleeps away the cold months, but is not averse to coming out for a brief dance when the January sun has warmed its favorite wooded glades and a broken maple

ranch offers some tempting droplets of sweetened sap. The outdoorsman knows this butterfly well, and treasures the first sight of its dancing flight in March or April as a sure sign that he trout will soon be rising and that arbutus is planning a surprise barge of delightful bloom on its secluded sunny banks.

The following morning was cold and gray and windy. An occasional spate of rain chased itself along the highway, to add to the general discomfort of the forenoon. As I returned from a morning chore to the neighboring village I noticed a bedraggled skunk lumbering along in the wet grass by the roadside. He seemed to be carrying something in his mouth so I pulled up for a better look.

While nosing about a trash pile somewhere this skunk had borrowed some real trouble. He had poked his inquisitive nose into the wrong place and what I had thought was an object in his mouth turned out to be a jam jar which had wedged over his head and was slowly killing him. Apparently he had entrapped himself several days before, for he was quite wobbly on his legs and bewildered in his actions. He staggered slowly across the road, the jar bumping along heavily with every step, and pushed his way through the dripping weed-growth into the adjacent field.

I was too well dressed for any close encounters with Mr. Big Smell. Ten minutes later my wife and I passed that way again. The skunk was still in the field, lying on his side in a shallow furrow, and breathing heavily. A skunk is a skunk, but a suffering animal is something else again, so I splashed through the weeds to see what I could do.

He paid no attention to a few small stones which I chuck at him to get him on his feet. There were no larger rocks handy but there were some long dead weed stocks near. I tossed one of these at him like a

### *Myrtle Warbler*



javelin. In a flash that black tail went up and he went into that famous fighting crouch. I did a magnificent backward standing broad-jump. Fortunately he withheld his fire and there were no casualties.

We stopped by the neighboring farm and reported the incident to the farm manager, enlisting his aid in trying to free the skunk. It was not until the next noonday that we learned the outcome. They had found the skunk in the field and had smashed the jar with a ten-foot length of pipe. By a queer quirk of fate the jar had broken so as to leave a small collar of glass intact around the animal's neck.

Up to that moment the skunk had behaved quite well. They made another try for the collar. This was more than Mephitis could stand. He uncorked a dram or so of attar-de-skunk and waddled off into the protection of a nearby drain pipe. Now we have a skunk roaming the neighborhood all dressed up in a glass collar and with an amazing appetite.

There is a certain headiness, a sort of special buoyancy to April's burgeoning hillside springs. The countryman knows this well, and he quaffs great tankards of the foamy stuff as

he explores favored ravines where bloodroot has unfurled waxen petals and wild ginger treasures its odd blossoms close against the ground. Adam's ale is brewed the year round, but it is the April draft that works miracles of agility in the blood of somber creatures.

The same intoxication which elates the April brook as it froths and dances and shouts on its tumbling course down the steeps from meadow to meadow seems to thrill in the veins of the shiny-sided suckers as they come gamboling up the rapids to their spawning beds. Only when tapster April draws the ale and the barmaid brooks dance blithely down with foaming mugs do these normally dull and sluggish fish awaken to exuberant activity.

The countryman lays out his cir-

#### WANTS DATA ON SNAKES IN WINTER

Mr. Steve Harwig, 201 Swissvale Avenue, Pittsburgh 18, Pennsylvania, an amateur snake hunter among those mentioned in the Special Issue No. 2 of this magazine, would like to hear from readers who personally know of rattlers killed or seen in Pennsylvania during this past deer season or during the winter. Details of date, size, weather and location are of particular interest to Harwig in continuing his fifteen year study of the rattlesnake.

cuits of the April wayside so as to provide for timely stops at every spring in the neighborhood. The limpid flood gushing free from its rock prison behind the rampart of Christmas ferns draws him into sprawling obeisance, and he kneels humbly in the upland pasture where the farmer has driven a pipe deep into

the shale to bring the water to his stock.

All springs have a strange attraction for leaves. They come from afar to drift into the cooling water and cover it up like brown snow. The countryman wants his fountains clear and open to the passerby, and he spends many happy April moments clearing these leaves and twigs and other Winter debris from the cold pools.

April is a therapist, a healer just as surely as is any man trained in the art of medicine. When troutng time rolls around in mid-April, something more than just another fishing season comes into being. This is the time when the true outdoorsman looks to his favorite haunts with renewed expectation. His anxiety to get away from it all heightens with each passing day. He longs to be taken from the noise of machines, the sight of bricks and mortar and the smells of the city, to places where existence is simplified.

This is a natural yearning. The instinct of the primitive dwells deep in the hearts of all men. To get back to his ancestral days—days of rawhide and muskets and traplines—the countryman goes fishing. And in going fishing he fills his creel to the brim with the sum and substance of a refreshed day. Maybe, if he's lucky, there'll also be a few trout.

Along the trout stream all men's sins are forgotten. The ill-tempered character turns into an altogether different person. The April therapist is at work on him. No matter how dull and dispirited the Winter may have left him, meet him in the middle of a big pool somewhere and he will be recreated, shorn of his faults. He may go fishless all day, but he will return home with a creel full of new spirit and better health.

Perhaps, among other things, that's what April is for.

. . . *The End.*



### Rabies Extermination Program Proceeds

The rabies campaign is well started in the control corridors surrounding infested areas in northeastern and southeastern Pennsylvania counties. It has begun to roll, also, in Cranberry Township, Venango County, one of several smaller pockets of infection in western counties.

Public acceptance of the necessity for drastic action to curb the further spread of the dread disease has proved invaluable. Farmers have

cooperated wholeheartedly, once the purpose and need of the rabies program has been explained by a game protector. Almost without exception, landowners have granted officers permission to conduct the work on their properties.

Recent snows of considerable depth, particularly in the northern counties, hampered effective work and lessened the success of the drive temporarily.

The drama of men matching wits with sly foxes, risking attack and possible infection while operating

in all kinds of weather in rabies areas, has fired the imagination of the people. Actually, game protectors carry shotguns and go methodically about an organized campaign to rid the infested areas of foxes. The Game Commission has no desire to dramatize the situation. Emphasis is placed wholly on a successful conclusion brought about by a careful, unhampered attack on the infested areas.

Now that people understand that the poison pellets used in baits carry only small doses of strychnine and that they are carefully hidden and checked upon to eliminate danger to humans, livestock, and water supplies, doubts and misgivings have largely disappeared.

Game authorities say it is too early for an appraisal of the results so far accomplished. They advise that success will not come early or easily. The task of stamping out the disease in approximately 8500 square miles of land in Eastern Pennsylvania is greater than most people realize and startling or quick returns are not anticipated. The public will be regularly informed of progress and results made in the various areas attacked.

In the western part of the state the next county to receive attention after the Venango County rabies situation is on the way to completion will be Butler County. Three townships there—Lancaster, Centre and Summit—will feel the effect of the poison campaign against rabies. If positive tests are reported on mad-acting foxes killed in a fourth Butler County township, Fairview, the program will be initiated there, also.

#### Banded Ducks Went Places

Last spring the Game Commission embarked on a new waterfowl program. Day-old mallard and mallard-black duck cross-breeds were reared to about 6 weeks of age and were liberated for the most part on water

and marsh areas removed from civilization.

Before they were released, 6182 of these young ducks were leg banded. Hunters who killed them were requested to inform Pennsylvania game authorities as to the place and date they were taken.

To date, reports on 695 of these bands have been received. This return of 11.2% corresponds to that received by the U. S. Fish and Wildlife Service on its duck banding program. Their records indicate that for each duck kill band returned 1½ bands are not submitted. Based on this formula the kill of Pennsylvania's 1951 banded ducks would more accurately be 1737.

The number of ducks reported killed by predators was low.

That ducks liberated under the new plan had "get up and go" is evidenced by the following record of numbers killed in other states and Canadian provinces: New York, 19; Ontario, 11; Michigan, 7; Maryland, 4; North Carolina, 3; Quebec, 2; Ohio, 2; Connecticut, 1; Delaware, 1; New Jersey, 1; Tennessee, 1.

It is anticipated that those liberated ducks that survived gun and predator hazards in the North and South will return to their original release areas this spring and there begin a buildup of waterfowl populations to supply additional sport for Pennsylvania hunters.

#### Club Rabbit Program Worries Ohio Game Men

Ohio's wildlife authorities are alarmed over the desire of many of the state's conservation clubs to increase the rabbit population by introducing cottontails from other states, the Wildlife Management Institute reports.

"This is a perennially favorite project of many clubs whose intentions are often far better than their knowl-

lege of rabbit biology. This direct method of improving rabbit hunting looked on with disfavor by most game administrators for a number of sound reasons. The first is its futility. Under a given set of conditions, a particular unit of land area can produce and support only so many cottontails. Since rabbits are notoriously prolific and are found in some numbers on nearly every farm in the country, whatever the population is on any single farm at a given time may be assumed to be near the maximum population that that land can support under current conditions. The cottontails present are quite capable of filling in any empty range within a short time when and if conditions improve.

"What happens when foreign rabbits are introduced into such an area when some factor is holding down the native population? Immediately the newcomers are forced to compete for food, cover, and escape shelter with those already present and, being less capable of caring for themselves in their new homes, they die. The result is a complete loss of the club's investment. Under the most favorable conditions, a survival of 40 per cent of all rabbits released is considered good; even under these conditions, few of the survivors ever breed, and their life expectancy is much shorter than that of the wild natives.

"The second, and most important actor is the danger to native wildlife and to hunters through the introduction of disease. Tularemia and bubonic plague have been found in rabbit shipments in recent years, and a number of states now specifically forbid the importation of all out-of-state cottontails.

"The same money and energy expended on habitat restoration will improve conditions for native cottontails, and the animals present in the local coverts will take care of any

necessary restocking as soon as food and cover conditions become favorable. Not so spectacular, perhaps, as opening a holding cage and watching a dozen fuzzytails bounce off into the brush; but far more certain, far less costly and far safer."

## Writers and Sportsmen Talk Conservation

On the evening of February 16, the Pennsylvania Outdoor Writers Association held its annual dinner meeting near Harrisburg. Many of the state's leading outdoorsmen and conservationists attended the session following the convention of the Pennsylvania Federation of Sportsmen's Clubs in the Capital City on the same day. Officials and representatives of various state agencies, too, were present.

R. J. Costley, Regional Director of the Allegheny National Forest, Warren Headquarters, gave an excellent address on the multiple values, recreational and economic, of the three-quarter million acre area he administers in Northwestern Pennsylvania.

Tom Kelley, nationally famous cartoonist-lecturer from Milwaukee, Wisconsin, entertained the writers and their guests with his art, and wit. He developed, through a rapid-fire delivery, the importance of soil and water to our prosperity and our very national existence.

At this meeting, John M. Phillips, Pennsylvania's "Grand Old Man of Conservation" was awarded the first honorary life membership in the Pennsylvania Outdoor Writers Association.

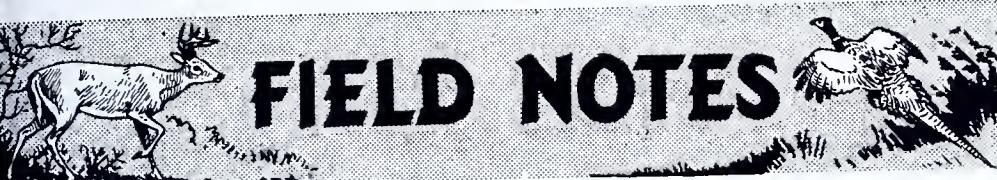
Johnny Mock, one-time President of Outdoor Writers Association of America and nationally recognized editor of the Pittsburgh Press column, ALL OUTDOORS, was tendered the first honorary presidency of the Pennsylvania writer group.

## INDIANA COUNTY HIGHWAY KILL ANNOUNCED

As in the past, Earl H. Pfeiffer, Highway Superintendent of District 10-4, Indiana County, has compiled a list of dead birds and animals that were removed from the highways of Indiana County. The full significance of this highway kill can be realized only when we remember that many more birds and animals were *not* found by the highway workmen. Some lived only long enough to escape into the adjoining woods or fields and a large number were carried away or eaten on the spot by scavengers. Listed below are only those birds and animals actually *removed* by the highway workers during the past four years.

### RECORD OF DEAD ANIMALS AND BIRDS KILLED BY MOTOR VEHICLES DURING 1948 TO 1951 INCLUSIVE—INDIANA COUNTY

Species	1948	1949	1950	1951	Grand Total (4 yrs.)
<b>WILD BIRDS &amp; ANIMALS</b>					
Rabbits .....	2266	2700	2554	2977	10,517
Groundhogs .....	66	145	132	120	464
Squirrels .....	64	86	37	128	315
Skunks .....	190	321	229	191	931
Raccoons .....	20	27	28	46	121
Deer .....	11	12	11	11	45
Opossums .....	525	948	884	862	3219
Weasels .....	11	7	...	10	28
Muskrats .....	4	8	1	44	57
Minks .....	1	...	1	2	4
Foxes .....	...	...	1	6	7
Porcupines .....	1	2	...	1	4
Grouse .....	18	22	22	32	94
Quail .....	3	3	3	6	15
Ringneck Pheasants .....	63	79	108	139	389
Woodcocks .....	3	...	4	4	11
Total .....	3246	4361	4015	4599	16,221
<b>DOMESTIC FOWL &amp; ANIMALS</b>					
Chickens .....	94	103	93	107	397
Ducks .....	2	2	...	4	8
Turkeys .....	1	...	...	...	1
Guinea Fowl .....	1	...	1	7	9
Owls .....	...	...	...	3	3
Hawks .....	...	...	...	1	1
Pigeons .....	1	...	...	...	1
Crows .....	...	2	...	...	2
Cats .....	440	476	483	589	1988
Dogs .....	232	331	343	406	1312
Horses .....	...	1	...	...	1
Cows .....	1	...	...	1	2
Pigs .....	1	2	...	2	5
Ground Squirrels .....	1	...	...	...	1
Turtles .....	2	...	1	...	3
Rats .....	...	7	4	3	14
Total .....	776	925	925	1123	3748



# FIELD NOTES

## Rat Takes a Beating

INDIANA—Special Fish Warden Luie Chichy of Dixonville, Pa. related to me the following incident he had witnessed on December 22, 1951, along Route 119 along little Nahoning Creek. He noticed an animal swimming upstream, and knowing a mink had been frequently seen at this spot he watched to see what would happen. When the animal crawled into the soft snow he saw it was a muskrat. A Cooper's Hawk appeared and dived at the muskrat and hit it. The hawk made two more dives at the muskrat hitting it each time but evidently due to the softness of the snow the hawk could not strike a solid blow. Mr. Chichy secured his shotgun from his car, and while the hawk sat in a nearby tree he got a shot at it. Despite the loss of a lot of feathers, the hawk managed to get away. District Game Protector A. J. Myscosky, Indiana.

## White Squirrels

SCHUYLKILL HAVEN—Mrs. Hunter from Pottsville, R. D. called me and asked when we started to track white squirrels. She stated that she and her husband are feeding two white and several gray squirrels. They come around at 10:00 A. M., and I will try to see them myself in the future. District Game Protector John Pencer, Schuylkill Haven.

## Corny But True

SAXTON—One day in January, Walter Ford, a local fox hunter, killed two grey foxes from a den that was near one of my game feeders. One fox had an empty stomach and the other was full of corn. Seems our

feeders are used by more than game. If the fox was satisfied with the corn and left the game alone, it still wasn't wasted corn. District Game Protector John R. Miller, Saxton.

## Substitute for a Tin Can

CLAIRTON—One morning this month, Joe Kozak, a rabbit trapper in my district, was making his usual check of his traps. When coming to the location of one of his traps, he noticed it was gone. Upon checking the area, he noticed the ground somewhat disturbed. Following this area that had been trampled by something for about 100 feet, he saw a dog that apparently was caught in some brush. On investigation, he found the dog was caught in the box trap, by the tail. In some way, the dog had gotten his tail caught under the drop door of the trap. Of course, the harder he pulled the tighter his tail became, so he had dragged it until being caught in some brush. District Game Protector R. V. Rea, Clairton.



### Mocker Comes North for Winter

**MECHANICSBURG**—It may interest bird watchers to know that on Saturday, February 16, 1952, I saw a mockingbird near my home in the eastern end of Mechanicsburg. There was just this one bird, but I definitely identified it as a mockingbird



through powerful field glasses. I saw this bird previously on February 12, and believe it has been hanging around all winter. It seems quite unusual for a mockingbird to spend the winter in southern Pennsylvania. In fact, they are somewhat rare even in summertime. Charles F. Stambaugh, Wildlife Protection Division.

### Field Mouse Maternity Ward

**NAZARETH**—A most unusual happening came to my attention the other day when one of my trappers found a field mouse in his box trap. The trap also contained five newly born mice and they were all dead. District Game Protector Edward M. Borger, Nazareth.

### “Snow Snakes,” Again

**AUSTIN**—I had a report of a snake that evidently did not know the difference in the seasons during the

past deer season. Two men, R Mastrine and Albo Cangoila, both Colver, Penna., were hunting deer West Darien Run in the vicinity Costello and Wharton and found rattlesnake that was still out hibernation. They killed it and showed it to several other hunters that vicinity. The snake had 7 rattles and was of medium size. It was able to crawl but seemed rather cold and sluggish. District Game Protector William D. Neely, Austin.

### Owl Goes Fishing

**AUSTIN**—Bill Padillo of Austin R. D. was checking his traps along the Prouty when he saw a great horned owl on the bank of the stream eating something. He returned to the house for a shotgun, then killed the owl. The unusual part was what the owl was eating. It was a brown trout that was of a size that most fishermen dream about, approximately 26 to 28 inches long by the parts we could piece together. There was a shallow riffle in the stream near where the fish was killed and evidently the owl caught the fish as it was trying to cross this shallow water. District Game Protector William D. Neely, Austin.

### Club Buys Corn for Turkeys

**RENOVO**—In this district we have a good supply of turkeys left for spring breeding stock. While we have snow the feeders got a heavy work out. With a good hatching period this spring we should have more turkeys in this district than ever before. A lot of the credit for the fine shape that our turkeys are in can be given to the Western Clinton Sportsmen Association, who carry on an extensive feeding program. So far they have purchased 1000 bushels of corn for their feeders. The Association has members from all over Pennsylvania and many of the neighboring states. District Game Protector Charles F. Keiper, Renovo.



### Great Great Grandma Cottontail

WEXFORD—Recently while engaged in some routine rabbit trapping I was pleasantly surprised to find in one of the traps a rabbit which had been tagged September 29, 1948. This rabbit was also trapped September 30 and October 24 of that year, but had not been trapped from the latter date above until February 1, 1952.

When initially captured in 1948 this cottontail was already at least one year old. With her fifth birthday coming up Molly cottontail has reached ripe old age and should she fall to some hunter's gun next season, the lucky fellow will surely need a pressure cooker! Project Leader Glenn L. Powers, Wexford.

### Trapping Close to Home

HUMMELS WHARF—During the last muskrat trapping season, Mr. Edward Hane, Hummels Wharf, discovered a good method to catch muskrats. He just sets a few crates of apples in his garage and then waits until they start chewing at the crates and carrying away the apples. He then sets steel traps at the crates and, resto, he has a catch. During the

past season, he caught four muskrats in his garage in one steel trap. The odd thing is that he does not live close to any water, the Susquehanna River about one-half mile away being the nearest water. District Game Protector Raymond E. Holtzapple, Middleburg.

### Deer Put on the Feed Bag

WASHINGTON—On January 2, 1952, I received a call from Mr. Moore of Washington R. D. 6. The complaint he had was that three deer were coming into his horse stable, chasing the horses out and eating their feed. The one horse had a hole punched in the side of its nose; apparently the buck had hit him with his horns. The horses would not stay in the stable unless Mr. Moore would stay with them. As soon as he would leave the horses would run out of the stable and would not go back to finish their grain. That is when the deer would show up and they finished the horses' feed. Mr. Moore changed the feeding time for the horses, and now everything seems to be all right. District Game Protector G. T. Church, Washington.





## Outdoor Kids

By Hal H. Harrison

If you were asked to name America's best known bird, which one would you name?

Chances are that you will name either the crow or the robin. If you live in the country, perhaps you know the crow better, but surely those who live in the cities and villages, as Billy and Jane do, know the robin best of all birds.

Last spring, a robin nested on a shelf nailed to the side of the garage in back of Billy's and Jane's home. Another time, a robin built its nest on telephone-wire insulator at the corner of the house. Almost every year there is a nest in one of the horse-chestnut trees in the front yard.

The children always enjoy watching the female (the male does not help build the nest) carry mud and straw and grasses.

One day Billy watched a robin hunting worms in the garden. It cocked its head on one side, and Billy said it was listening for the worms to move. He was wrong. It was *LOOKING* for the worm. A robin's eyes are on the side of its head. When it is close to the ground, it must turn its head sideways to look straight down.

A male robin fought its reflection in the garage window day after day. At first the children thought it was trying to get inside. When they opened

window, it flew away. When they lowered it, the robin came back and the singing began again. Finally, when they rubbed Bon Ami on the glass and removed the reflection, the trouble ended. Mr. Robin did not know that his image in the glass was his own reflection. He thought it was a rival robin, and he spent his time trying to chase it from his territory.

Baby robins have spotted breasts, but adult robins do not. Why? Because the young birds, like bluebirds, are members of the bird family called thrushes, and typical thrushes have spotted breasts. The youngsters disclose the relationship to the typical thrushes by wearing spots on their breasts.

Because they live in the north, Billy and Jane bid the robins good-by in autumn. Most robins migrate, but not all. Where food is abundant and shelter is easy to find, robins sometimes winter as far north as New England. These are the robins the newspapers report in January as "the first robins of the year."

. . . *The End*

### How High Will a Rifle Shoot?

This is a matter about which practically all shooters, at some time or other, have speculated. To boil it down into general terms, with the safety element as a prime consideration, the answer is "A lot farther than you think."

John J. O'Connor, of the physics and ballistics research laboratory of Remington Arms Company, Inc., has reduced the matter to a mathematical formula which reveals the rather surprising information that a bullet fired vertically upward will reach a height equal to more than half the maximum horizontal range of a similar bullet fired at the optimum angle of parture.

Mr. O'Connor says: "Since aviation became popular, there has been a slight but present danger from amateur anti-aircraft men on the ground. In the early days of commercial planes it was all too common for planes flying relatively low over the more remote hills of the eastern United States to be met by bullets. When the German dirigibles were making their regularly scheduled flights to this country, there was at least one incident when a dirigible was hit by a small caliber bullet. These and other accidents probably reflect the lack of knowledge of the impressive height which small caliber

bullets can attain. In other words shooters depend upon gravity to make their prank a harmless one. Unfortunately gravity, though highly effective in making a poor range guesser come home with an empty trophy bag, is relatively ineffective in stopping a bullet projected skyward.

"For example, consider the .22 long rifle bullet, considered by many, unfortunately, to be a child's toy. As is well known, the high speed version has a maximum horizontal range of about  $9/10$  of a mile. Not so well known is the fact that if fired vertically upwards, it will attain a height of about  $7/10$  of a mile or 3700 feet. Even regular or Match velocity .22 long rifle bullets will travel about 3500 feet upward. The force of gravity at the muzzle amounts to only 1.63% of the total force acting. At any velocity above 280 feet per second, the air resistance forces are larger than forces due to gravity.

"Calculations indicate that under any practical conditions the attainable vertical height above gun position is more than half the attainable horizontal range, regardless of bullet or muzzle velocity. When we realize that the maximum horizontal range for center fire rifle bullets may be as much as 6000 yards, we see that it is extremely hazardous to shoot at high angles of elevation.

# Signs of Spring

By Grace O. Beach

THE paper is all fixed in the typewriter and there is a deadline to meet. That doesn't seem to help the situation one bit. Thoughts go flitting about like gay fantastic butterflies one moment, race around on an energetic spree the next, then tumble into a lazy do-nothing slough from which a steam shovel couldn't lift them. The paper continues to be a ghostly white, not a typewriter key has clicked in the past hour and not a single word has appeared to mar the empty whiteness of the page.

From that description you've probably guessed the trouble. Your Diana has the spring fever in its worst possible form. But we have to get started somehow.

What is there in nature's makeup that gets you into such a stew, especially so early in the season? Or is it a psychological chain of events that causes a woman to look quizzically at everything as if a veil had suddenly been lifted from the eyes? Suddenly all the rooms appear to look dingy, dull and uninteresting and mentally you begin rearranging furniture, plying soap and water and seriously considering an entirely new color scheme. For some undertermined reason, these shenanigans seem to belong entirely to the feminine contingent and bother the men not one bit.

Could it have been that shop window full of spring hats so gay and pretty, or the window next to it filled with spring and summer sports

clothes that set your editor's fever soaring and brought on the attack?

It may have been the meeting the "Junior Ikes," young conservationists full of enthusiasm, planning for coming field trips and a big weekend tree planting event.

Or possibly, it may have been the walk in the garden—finding that the early tulips and daffodils had thru their green leaves above the earth showing definite and realistic tracks that the rabbits had beat us to. They had been busily tasting the first spring salad plate from natural food supply and apparently enjoying the change in diet.

Perhaps it was the sweet melody of the song sparrow, his throat throbbing in violent effort as he swayed happily on his giant telephone wire swing, or the brilliantly beautiful cardinal and his mate splashing merrily in the little pool of water the rain left in that uneven spot on one of the flagstones, officially opening the bathing season.

Then, too, it could have been the influx of seed and flower catalogues. Completely captured by the brilliant colored beauty as leaf after leaf were turned we went completely berserk and ordered more than any rigid minded gardner would even consider then deliberately mailed the order as we couldn't change our minds.

Also a contributing factor might have been because one of the fine hyacinths so carefully nurtured through the winter has burst into bloom, filling the room with its delicate perfume which may be imbued with some mystical power.

It's a sure thing that the lone robin that appeared from nowhere this morning chirping his liquid clear-



"cheer-up get-up" from the apple and bringing every member of family scurrying to the window watch the audition, didn't help the situation one bit.

Or, did the surprise we got at noon, when we heard a scratching at kitchen window and found our "bright eyes" the Chipmunk had waked from his winter nap and was looking in his old favorite haunts for sun and nuts.

The final straw may have been when one of our sportsmen friends waked in rubbing his hands gleefully announcing, "well, I got my fishing tackle out last night and have erything all set." Then enlisting man of the house in a trip down the farms to see Charlie about the plantings, so he can work it into his spring schedule and amid such flurry and confusion they took leaving a quietness that seemed lab-like in their wake.

In any event there are very definite signs of spring in the air. Don't let these advance signs throw you off the track. These next two months are the lowest ebb for wildlife. Their resistance is low and food supplies have either been used up entirely or are very scarce. A trip to your favorite hunting spot with a food supply is even more important now than it was during the colder months. That food may be just the thing that will carry wildlife through to the nesting season in good condition, until green things begin growing again.

Birds will be coming back from warmer climates and they too, will find food supplies low. Don't forget to keep your bird feeders full of seed and any other offering you may have on hand, such as sweet cake, doughnuts that have gone stale, dried potatoes, pieces of suet or anything else which make them tasty morsels and keep them well supplied until bugs become plentiful.

A few roasted peanuts, or black or English walnuts cracked will bring

the squirrels and chipmunks frisking about and give you endless delight watching their antics.

This is the time of year to do your tree planting. Maybe you know just the spot where a few nut trees or some apple trees could be planted where they will later supply food for wildlife. There are also the mulberry trees, and dogwoods which also add to the supply. Or you may want to put in some evergreen trees to provide cover. These will not only supply food and cover for animals but they will put a protecting umbrella over the soil preventing it from washing away and helping to hold the water supply, doing a three-fold job.

There are quite a number of berry shrubs that will supply both food and cover. These can be planted along fence rows, on banks and various bare spots. Like trees, they not only add food for birds and wildlife, but they too help to hold soil and water.

Then there is the farmer near you, who may be more than willing to enter into a planting agreement with you. Maybe together you can arrange for the planting of a strip of grain or corn that will be left standing next fall for food and cover for wildlife, particularly the small game variety. Or you may plant a fence row together or a strip near a woodlot. He may have a piece of ground that can not be used for crops but would do well and improve the soil, cut down erosion, and provide cover by planting it in trees. Many such planting arrangements are made between sportsmen and farmers for a few dollars or a little help in the planting or during the busy season. Good relations grow out of these cooperative agreements and everyone gains by them. Here again your Game Protector or your County Farm Agent will advise you.

Any or all these suggestions are good conservation practices and help to supply better sport.

Ladies can participate in these

spring feedings and plantings, and so can the other members of the family. Why not all join forces and have some real fun doing a conservation job as a family unit.

Now that we have covered the "signs of spring" and what causes spring fever we find the column all done. You're editor hopes it has stirred you into action. Let us hear how you make out with your plans.

### Thank You All

for the many cards sent in answer to the SOS for the conservation and protection of the little Key Deer in Florida. Printed herewith is the letter received from Hon. James H. Duff, our conservation minded Senator, into whose hand we placed your cards:

United States Senate  
Washington, D. C.

October 31, 1951

Mrs. Grace O. Beach  
506 City-County Building  
Pittsburgh 19, Pennsylvania

Dear Mrs. Beach:

I was very much heartened to learn about your campaign in behalf of the Key Deer and I want to assure you that I will do whatever I can to protect these little animals from extinction.

The legislation to which you refer, H. R. 2897, to establish a sanctuary for the deer, is pending before the House Committee on Merchant Marine and Fisheries. The question of authorizing this sanctuary probably will be taken up promptly after the new session begins in January.

In addition to the letters which you forwarded to me, I have received a number of communications from your readers, urging my support for the Key Deer project. I hope you will assure them of my interest.

Sincerely yours,  
/s/ James H. Duff

\* \* \*

National Wildlife Week is March 16th to 22nd, during which the accent will be on carrying the battle for the Key deer to a successful conclusion. If you haven't already sent in your appeal do it during wildlife week.

. . . *The End.*

### CORRECTION

In the March issue of GAME NEWS two errors appeared on the map of Delaware County on pages 32 and 33.

The county seat as well as the District Game Protector's headquarters were erroneously indicated to be in Chester, whereas both are actually located in Media.

The musk ox is an unpredictable animal. It may, in its confusion charge a party of hunters; yet, if it does not see or scent the gunner, may refuse to run from gunfire.

\* \* \*

The parrot does not build a nest but lays its eggs in the soft dust that accumulates at the bottom of the trunks of decayed trees.

\* \* \*

The owls have an external ear, a conch, covered by feathers, which exists in no other bird.

\* \* \*

In swimming downstream a fish must swim faster than the current or be suffocated by water entering its gills and remaining stationary.

\* \* \*

The cuscus is a small animal of New Guinea that is somewhat similar to the flying squirrel. When it thinks it is in danger, the cuscus suspends itself from a branch by its long prehensile tail, swaying among the leaves as it if were some dead fruit. It will remain in this position as long as it thinks it is observed or until exhausted.

\* \* \*

The muskrat of India has a powerful scent so penetrating in nature as to render unfit for consumption bottles of wine, the corks which have come in contact with it.

\* \* \*

The gibbon, smallest of the man-like apes, always drinks by dipping his hand in water.

## PENNSYLVANIA GAME COMMISSION

## LEGAL BIG GAME KILL

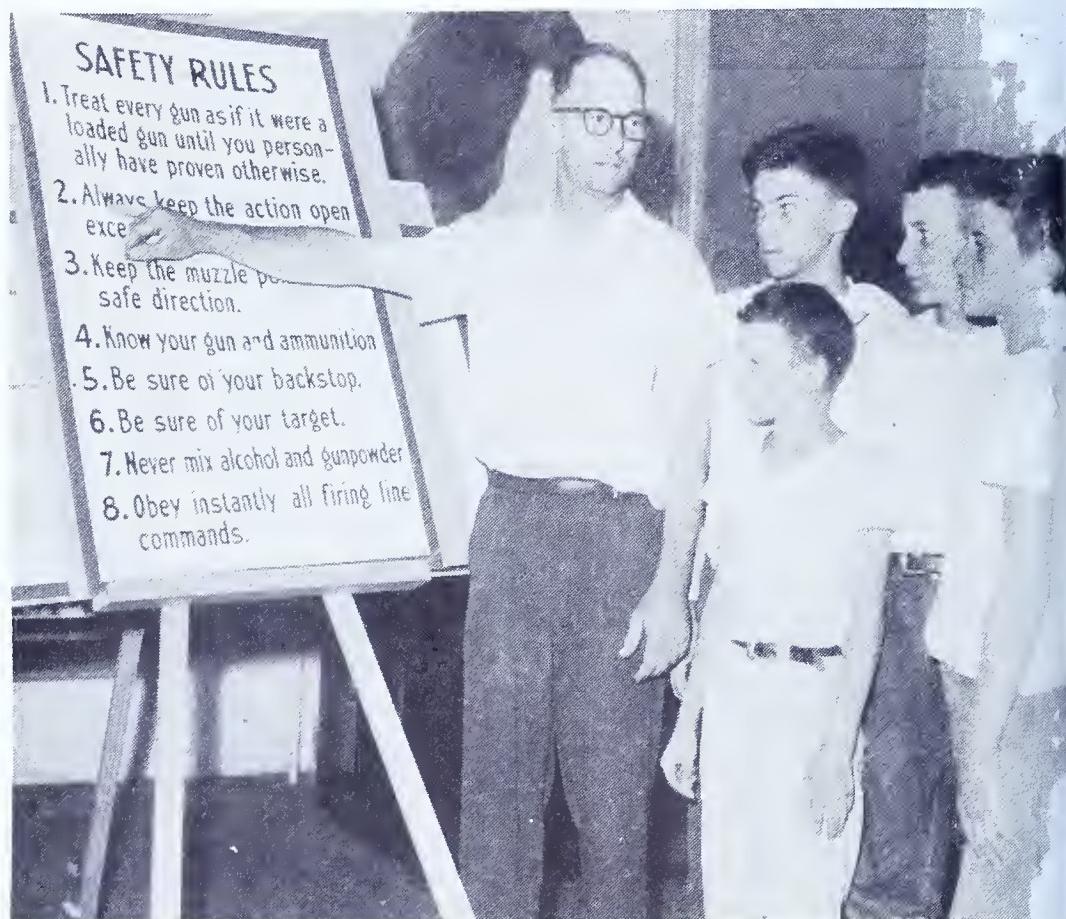
(Based on Tabulation of Game-Kill Reports)

Counties	Deer— Legal Antlered 1950 1951		Deer— Legal Antlerless 1950 1951		Bears 1950 1951	
	ms	77	62	239	36	...
gheny	39	54	22	17	...	...
strong	238	227	186	175	...	...
ver	67	61	26	19	...	...
ford	617	548	Closed	559	...	...
ks	92	123	460	97	...	...
r	253	342	417	223	1	...
xford	532	768	1,501	916	7	...
ks	62	75	151	36	...	...
ler	198	241	107	142	...	...
mbria	166	281	563	216	...	...
eron	799	1,074	Closed	1,408	32	...
bon	221	327	505	188	...	...
tre	1,132	1,419	Closed	1,443	4	...
ster	34	29	94	14	...	...
rlion	273	409	198	272	1	...
arfield	1,207	1,672	Closed	1,861	8	...
ton	1,018	1,291	Closed	1,566	17	...
umbria	191	242	549	218	1	...
wfورد	273	297	314	326	...	...
mberland	88	92	419	39	...	...
aphin	161	206	738	106	...	...
aware	3	6	6	4	...	...
...	971	2,095	Closed	2,257	18	...
...	162	207	258	156	...	...
ette	266	295	224	194	...	...
est	490	1,812	899	1,935	18	...
nklin	302	292	Closed	168	...	...
ton	298	213	Closed	189	...	...
ene	56	59	32	18	...	...
ntingdon	489	643	1,150	476	1	...
iana	324	388	466	371	...	...
erson	296	485	368	503	5	...
iliata	246	205	Closed	184	...	...
kawanna	158	204	453	153	5	...
acaster	18	29	50	13	...	...
wrence	46	39	39	20	...	...
anon	56	97	259	47	...	...
high	27	35	104	16	...	...
erne	472	559	1,476	580	3	...
oming	1,146	1,377	2,252	1,680	25	...
Kean	600	1,933	2,068	3,016	22	...
rcer	106	99	104	97	...	...
lin	271	284	Closed	187	1	...
roe	550	633	1,304	563	14	...
ntgomery	17	36	74	15	...	...
ntour	23	13	123	26	...	...
hampton	41	66	150	35	...	...
thunderland	106	105	370	134	...	...
ry	432	401	Closed	341	...	...
ladelphia	...	...	...	...	...	...
e	931	952	Closed	1,230	30	...
ter	1,204	2,335	3,639	4,381	57	...
uykill	430	408	1,119	311	...	...
der	148	108	Closed	98	2	...
erset	500	822	850	615	...	...
livan	568	1,006	Closed	1,236	19	...
squehanna	392	513	759	586	...	...
ga	861	1,361	1,913	2,092	28	...
ion	182	166	459	118	...	...
ango	357	637	304	556	...	...
rren	656	1,968	1,131	1,781	17	...
shington	36	22	9	10	...	...
yne	566	761	1,272	813	11	...
ntmoreland	449	619	593	481	...	...
oming	240	357	601	309	6	...
rk	53	70	100	24	...	...
ounty Unknown	19	27	48	56	1	...

TOTAL ..... 23,302 34,582\* 31,515 37,952 354

Includes 33 killed during the Special Archery Season.

# Hellertown Sportsmen Teach Boys How To Sho-



Photos By Sunday Call-Chro

*A group of young marksmen-in-the-making learn their first lesson in the shooting game by studying the Safety Rules.*

WHEN a house-painter near Saucon Creek had a bullet smash into a home just a few feet above his hand, he decided it was time to take action.

The man was a member of the Hellertown Sportsmen's Association and the action he decided on was aimed at youthful riflemen who take to the fields armed with deadly weapons and a deadly lack of knowl-

edge that rarely exceeds knowing to pull the trigger.

The outcome of this incident the summer of 1945 was a Rifle Club sponsored by the Hellertown Sportsmen's Association which has since trained some 200 boys in the correct way to handle a rifle and the safe way to conduct themselves in the field.

This summer with the cooperation

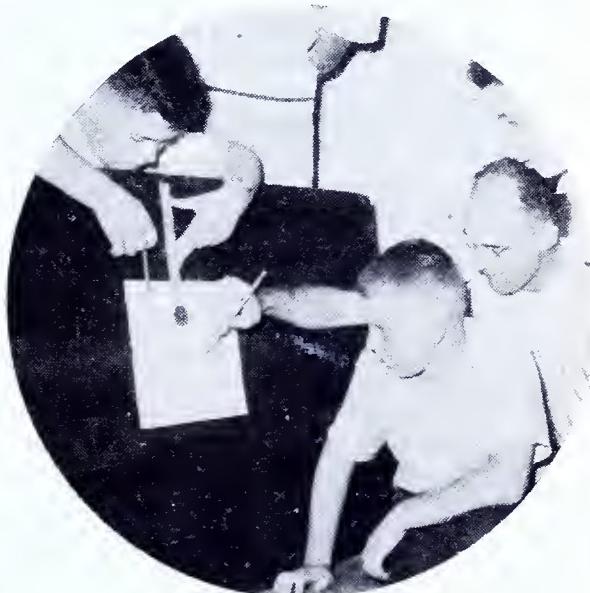
National Rifle Association and  
of civilian marksmanship.  
Hellertown sportsmen are  
their seventh annual  
rifle training course.  
en boys between the ages of  
are enrolled for the seven  
course. William H. Danko,  
vn, is chief instructor, and  
aker, Hellertown, is assistant  
instructor.

In the Junior organization was  
in its infancy in 1946, it was handi-  
by the lack of a place to  
range. Since then Joseph Beltch Jr.  
solved the problem by donating  
part of his property on Easton  
Ave., near Cherry Lane, in Heller-  
town, to the organization for use as a  
range.

Shortly after the association de-  
cided to conduct its small bore rifle  
course, the group affiliated with the

National Rifle Association and se-  
cured information and data necessary  
for the formation of a Junior Rifle  
Club.

With the cooperation of the NRA,  
the Hellertown organization was able  
to secure grants of ammunition and  
targets from the Director of Civilian  
Marksmanship, a branch of the Army



*Below—The spotting scope tells the story  
at a time.*



whose main purpose is to encourage civilian rifle practice and training.

In 1946 the junior group went into a full-scale training course. The initial registration totalled 40 boys.

The first two sessions were held indoors at the Odd Fellows Hall in Hellertown and the last five are being held at the rifle range.

The sessions cover everything from the general overall sport of hunting down to proper care of the rifle. There are courses in triangulation, position shooting and firing line shooting.

The training program has a dual purpose. Every member of the junior rifle organization automatically becomes a member of the Hellertown Junior Sportsmen's Association. In this organization youngsters learn the basic principles of game stocking, conservation, hunting, trapping, planting, fishing and identifying wildlife, plants and animals, all knowledge which will be useful to them in future years when they take their place among outdoorsmen.

Perhaps the highest tribute paid to a small bore rifle training program such as that sponsored by the Hellertown sportsmen comes from the National Safety Council. The council recognizes the training program as the greatest single factor in reducing firearms accidents, because it teaches "Safety Through Skill."

*—Sunday Call-Chronicle.*

### Juniata County Sportsmen Appeal to Motorists

The Juniata County Sportsmen's Association recently embarked on a novel and commendable project designed to caution motorists against running down game on the highways.

White placards carrying in large red letters the heading, ATTENTION ALL MOTORISTS, were posted along the roads of Juniata County during National Wildlife Week. A cleverly worded message on

the signs appealed to drivers to tend their consideration for birds and animals throughout year, rather than confining it to seven days in the month of May known as Wildlife Week.

### Sayre Club Banquet Draws Record Crowd

The sportsmen of Sayre, Pennsylvania really take their club seriously as evidenced by the crowd that tended the recent 15th annual banquet of the Sayre Sportsmen's Club. An all-time record attendance of 1,000 was surpassed by five the previous record established at the 1942 gathering.

James Crowley of Sayre was elected president of the club, Francis Reagan was named vice president, and Vernon A. Hicks and Andrew J. Zeller were reelected secretary and treasurer, respectively.

Carl Stainbrook, Supervisor of the Northeast Division of the Pennsylvania Game Commission, was present and spoke briefly on the commission's work.

Three motion pictures and a series of slides were shown and prizes were presented to the winners of the club's fishing contest.

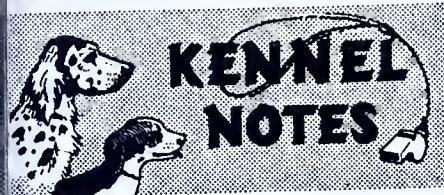
In his secretary's report Mr. Higgins stated that the club had raised 14 pheasant chicks for release at 14 to 16 weeks. He also reported the release of 2,400 pheasants, 85 wild turkeys, 440 wild ducks and ninety pairs of quail by the Game Commission in that area.

---

The woodcock never sees what she eats. By driving her 3-inch bill into the mud, her highly sensitive tip feels earthworms upon which she feeds.

\* \* \*

The killer "whale" is not really a whale but the largest of the porpoise family.



By Herbert Kendrick

OUTDOOR sportsmen who are specialists in one type of birding will probably continue far into the future, the development and breeding of pointers and setters. The majority of men with whom I hunt are perfectly satisfied with the pointer or setter breed and their future plans include a breeding program using these same lines. These individuals spend most of their time

## The Weimaraner

hunting quail in wide open country, and seeking grouse in the woodlands. It is simple to understand their choice in hunting dogs when you know their needs.

In recent years game has been hunted by a greater variety of breeds of dogs because of varying conditions. A man now has a better selection from which to choose a dog qualifying for his particular tastes, environment, financial condition, and game. If a person can accommodate only

*For versatility the handsome Weimaraner is hard to beat.*



one dog, is limited to hunting a small area each year, and intends to combine fur and feathers, it is proper that he select one of the specialized breeds gaining popularity in America today.

The most highly advertised of all the special breeds is the silver-grey, short-tailed, pointer-like Weimaraner. This gentleman is powerful, keen, brilliant, swift, tough, warmly coated, and I am told he is easily trained. Jack Baird describes him as "poetry in motion." Their quietness in the field has earned them the famous nickname "grey ghosts."

Weimaraners were developed in Weimar, Germany, about 1810 when the nobles of the Court of Weimar were searching for dogs that could be successfully used in all types of game. According to historical reports, requirements were fulfilled.

The early development was a very careful system. The dogs were home reared, and an appointed "breed warden" allowed only the superlative to reproduce. Even now in this country the Weimaraner Club of America employs a very strict breeding policy. By continuation of this guardianship perhaps the Weimaraner enthusiasts will teach other breeders a valuable lesson.

According to reports most of these dogs are natural pointers, retrievers and trailers. Their training can be started at the early age of six months provided the teacher is not too harsh and severe. They are used for retrieving on land and in water, holding their own in our modern retriever trials. Furred game is successfully hunted by the ghost, and he points his feathered game. Although capable of being an all around gun dog it is reasonable to assume that nearer perfection can be attained by concentration in one phase.

One of the chief merits of the breed is its adaptability. His ability to hunt within range of the gun in heavy

cover, and run wide in open country makes him a valuable gunning asset.

These dogs show remarkable devotion to a master and progress more rapidly when owner trained. Training is highly important for all dogs. The greatest bred pup can never be classed superlative without the proper training. Many Weimaraner owners have heard so much of miracle feats they expected to receive a dog that required no schooling. It is a sad disappointment when any hunter expects to enjoy the fine art without thorough preparation both for himself and his dog.

John Herman of Harrisburg has acquired a young Weimaraner and is certain to have him ready for the field next season. John expects to use him for ducks, quail, ringnecks and grouse. The Herman home is extremely fond of the new member, and I know he will be well cared for, properly trained, and sufficiently hunted.

The dog was shown by his master at a gun dog meeting at the State Farm Show last month, where many people saw the breed for the first time.

Bob Bates has joined the fraternity of Weimaraner owners with his nearly five months old bitch. She has completely taken over the Bates home, insisting upon sleeping in Bob's bedroom. I thoroughly enjoy reports of the dog's progress in the field. Her latest accomplishment was capturing a full grown rabbit delivering it unharmed to her master.

These two men have dogs that love and great gunning experience await them.

In about twelve years the Weimaraner Club of America has become the largest single breed club in the world with a membership of over 2,500 all pledged to work unceasingly for the betterment of this great breed. All owners in America are required to be members of the club.

. . . *The End.*

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Phone: 4-2661

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NORTHEAST DIVISION—C. C. Stainbrook, Supervisor, 987 Wyoming Ave., Forty Fort.  
Phone: Kingston 7-6193

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Phone: 5400

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Phone: 872

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Washington, Westmoreland.

# PREVENT FOREST FIRES!

Carelessness can destroy timber, game, property and human lives. Snuff out matches and smokes completely. Quench fire embers carefully. Experienced hunters: please caution novices.



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PENNSYLVANIA

DOCUMENTS SECTION

# Game News



Max Fournier

P38.34

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1952

10 CENTS



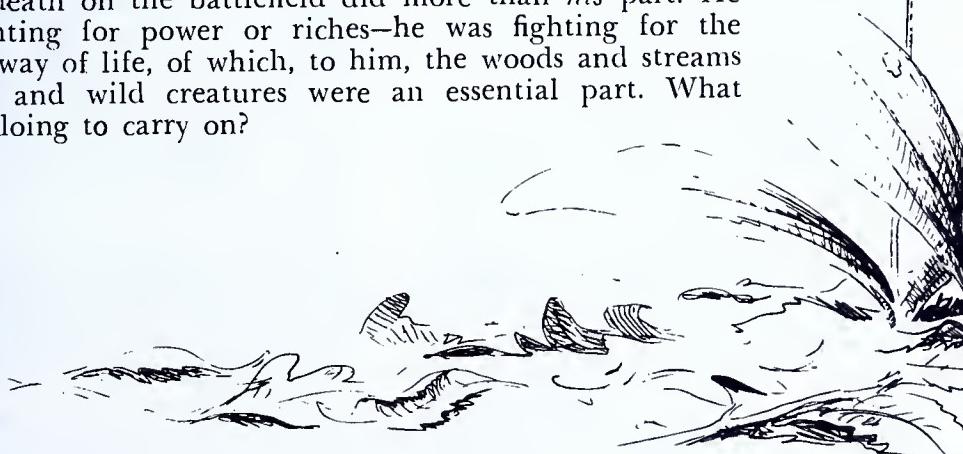
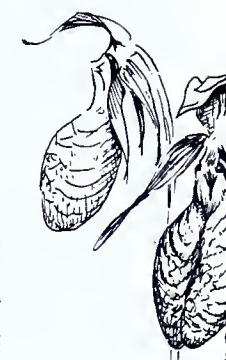
# *Editorial*

ON THE thirtieth day of May America pauses to pay tribute to her war-dead—to her heroic sons who laid down their lives that their fellow man might enjoy the freedom and independence that typifies our country. Parades are the order of the day; the stirring strains of band music and the tramp of marching feet are heard on every Main Street. Floral tributes are placed on flag-marked graves, and every citizen's heart is filled with gratitude for the sacrifice our boys have made. But is gratitude enough? Have we done our best to assure that this sacrifice was not made in vain?

To be sure, wars are waged to halt invasions, to escape oppression, to gain land or wealth. But to the average G. I. the important things are the *little* things, the simple, everyday pleasures that most Americans take for granted. Mom's home-cooking, the corner drug store where the gang hangs out, that merry stretch of trout stream that always produced a keeper or two, the hemlock-studded grouse cover back at the ridge, the eager setter patiently awaiting his master's return—*these* are the things that make a country worth fighting and dying for. Have our lads perished to save an America that doesn't live up to their expectations? Would they be pleased to see what we have done with the good old U.S.A. and its homespun charms? Have we preserved for posterity the little things that meant so much to them?

You can supply your own answers to the key questions. Are we protecting the beauties of nature for posterity's enjoyment? Do we teach our children to do better than their predecessors in caring for our outdoor heritage? Are we supporting wise legislation and local activities designed to improve hunting and fishing? Are we playing the game squarely—obeying the laws and respecting bag and creel limits? Can we be called "gentlemen" in the field: does our hunting etiquette promote better farmer-sportsman relations? Are we aiding the cause of more open hunting grounds for ourselves and other nimrods?

Unless we do these things we are betraying a trust. The lad who met death on the battlefield did more than *his* part. He wasn't fighting for power or riches—he was fighting for the American way of life, of which, to him, the woods and streams and fields and wild creatures were an essential part. What are YOU doing to carry on?



# Beware of the Green Demons: Poison Ivy and its Kin

By William C. Grimm

MANY an otherwise pleasant summer outing, picnic or camping trip has ended unpleasantly because one or more of the participants contracted a bad case of ivy poisoning. One can't go very far afield without risking the possibility of getting a dose of the stuff. The plant may be growing in the vacant lot next door, or perhaps even in a remote corner of your own garden. It isn't necessary to take a lengthy excursion into the country in order to meet it. If you are an outdoor enthusiast, or you work where you might come into contact with the plant, you will be wise if you make yourself thoroughly acquainted with it; and, of course, avoid it wherever and whenever possible.

A surprising array of innocent plants are often mistaken for poison ivy, yet many of us fail to recognize the genuine thing when we see it. Actually it is a comparatively easy matter to learn to distinguish poison ivy and its other poisonous relatives. One need not be a trained botanist—merely a keen observer. It pays, too, to be able to recognize and avoid these green demons.

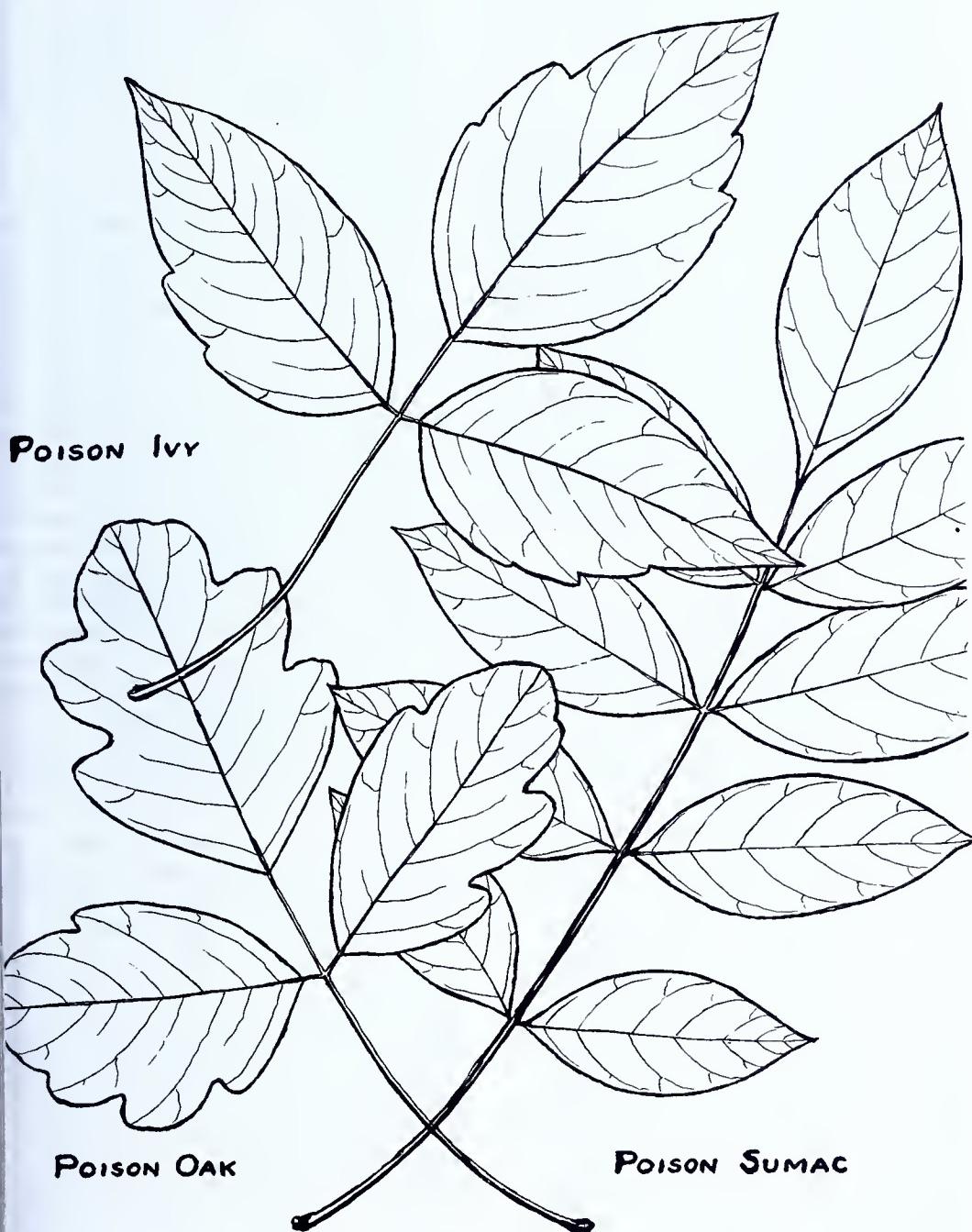
Most of the trouble is caused by the real poison ivy; a plant which the botanists know as *Rhus radicans*. It has a wide range in the eastern United States and it may occur almost anywhere. Highly variable in habit, the poison ivy may be found in lawns and other grassy places as a low-creeping plant; or along fence-rows it may occur as a loosely straggling shrub. It also climbs the trunks of trees, holding fast to their bark

with thousands of tenacious little aerial rootlets.

The leaves of the poison ivy are sufficiently characteristic to enable one to identify it at a glance. Each leaf is divided into three leaf-like portions which are known to botanists as "leaflets"; but the average person will call it "three-leaved." These leaflets are oval or somewhat egg-shaped in outline, pointed at the tip, and are more or less rounded at the base. Their margins usually have a few rather large and irregular teeth. The terminal, or top leaflet stands on a distinct stalk, usually half an inch or more in length; but the other two leaflets have rather inconspicuous stalks. On luxuriant plants the leaflets may be five or six inches long and from three to four inches across, but they are often very much smaller. The leaves themselves are scattered alternately along the stems.

In late spring or early summer, clusters of small and rather inconspicuous greenish-yellow flowers may appear in the angle formed by the leafstalk and the stem. They are scarcely noticeable to the passerby. In the late fall, however, they develop into clusters of creamy-white or waxy-white, roundish fruits which are not only conspicuous but often downright attractive.

From New Jersey, Maryland, and Tennessee southward to the Gulf you may encounter the poison ivy's kin, the poison oak. It is a low, somewhat creeping shrub. Its three leaflets are variously lobed, often quite suggestive of the leaves of an oak tree. The leafstalks and the lower surfaces



The three green demons, poison ivy, poison oak and poison sumac, are shown in this drawing by the author. Anyone who anticipates spending some time in the outdoors should familiarize himself with these "nuisance" plants.

of the leaflets are densely velvety-downy. This species is found principally on sandy soils. Another relative, the poison sumac, you are less likely to come in contact with unless you are a bog-trotter. It is a small tree or large shrub with a smoothish gray or ashy-colored bark. Its leaves, arranged alternately along the stems, have from seven to thirteen leaflets which have smooth margins and pointed tips. The leafstalks are often reddish in color; and the flowers and fruits are borne in long, spreading or drooping clusters. The poison sumac is also known as the poison elder or poison dogwood, but it is a sumac and neither an elder nor a dogwood. It flourishes only in or about wet areas such as swamps and bogs.

All three—the poison ivy, poison oak, and poison sumac—have certain things in common. They all bear ivory or waxy-white fruits which look superficially like berries, although they are not berries in the true botanical sense. These fruits often persist on the branches long after the leaves are shed, and may remain throughout the winter months. All parts of the plants, but particularly the foliage, possess an acrid oily substance which contains the poisonous principle—urushiol—capable of producing a severe dermatitis when it comes into contact with the skin. Inasmuch as this oil is scarcely volatile you are not apt to suffer any ill effect unless you come into actual contact with the plants; thus there is virtually no danger in passing by them at a safe distance. You can, however, get a mighty severe case of poisoning by getting into smoke from fires in which the plants are being burned, for the smoke particles may be laden with the acrid poison. Remember this the next time you are burning brush, if any of these plants are mixed in it. The oily poisonous substance may also be transmitted on shoes or other articles of clothing, on tools, or on your pet dog if they have been in con-

tact with the plants. Thus you might get a dose of poisoning without even being near a patch of poison ivy, poison oak, or poison sumac; but you can just about discount the possibility that the poison was carried by the wind.

Fortunately few cases of ivy or sumac poisoning are serious, but they are downright uncomfortable. It can be serious, however, if a very extensive area of the body is affected. There are those who will boast that they are immune to the poison, but don't get over confident about this apparent immunity. You might get by handling the plants for years, perhaps even be able to pull them up by their roots, then all of a sudden discover some day that your vaunted immunity has somehow vanished into thin air. Don't be so foolhardy. The best way to avoid the unpleasant effect of their "venom" is, of course to learn to recognize these poisonous plants and to respect them.

If you know that you have been in contact with the plants, or will be in contact with them, it will pay to take precautions. Your druggist can make you a lotion consisting of five grams of ferric chloride in a fifty-fifty mixture of water and glycerine. Applied to exposed parts of the body prior to contact with the plants, this lotion will very largely eliminate the hazard of poisoning. Some folk recommend a thick cream of soap suds left to dry on the skin. Immediately after contact with any of these poisonous plants you will be wise to thoroughly wash all exposed parts of the body using a strong laundry soap—not once, but several times—and, if possible, follow this by bathing the skin with a good rubbing alcohol. If these precautions are taken soon after contact—not hour later-nine times out of ten you won't be a victim of the poison. Immunization by "shots" has been quite disappointing.

Now if you don't discover that you

have been in poison ivy—or poison oak or poison sumac—until the onset of the severe itching and burning, accompanied with the advent of small watery vesicles, there really isn't too much that can be done about it. You can spread the affliction by rubbing, or scratching, or by applying a greasy ointment. If you develop a really bad case of poisoning you will do well to seek the advice of your doctor. Phenolated calomine lotion, obtainable at any good drug store, is one of the best standard remedies. There are also other good remedies on the market which have a kaolin, or clay, base; but strictly avoid any greasy ointment no matter how highly its manufacturer recommends it. It would, in fact, be better to do nothing. In most persons the symptoms of ivy poisoning usually appear in from twelve to twenty-four hours following contact. Sometimes, however, they may appear within a few hours, or not for several days. A great deal depends upon the individual's susceptibility and the amount of the poisonous oil deposited on the skin.

In the fall of the year, both the poison ivy and the poison sumac are beautiful; their leaflets assume the most blazing hues of orange and carlet, and with clusters of waxy-white fruits the plants look most alluring. Folks who are not thoroughly acquainted with the plants, but are struck by their autumnal beauty, sometimes make the sad mistake of gathering them for decorative purposes. In this case the beauty of the fall foliage had better be enjoyed from a discrete distance.

All three of these poisonous plants are members of the cashew family, another of whose members provides the delicious cashew nuts of commerce. They are also close kin to the red-fruited sumacs, none of which are in the least poisonous. One species, the Japanese varnish tree, which is very similar to our poison sumac, is the source of a black lac-

quer. Instances of poisoning due to the handling of articles coated with this varnish have been known to occur.

The fruits of these plants are eaten by several species of birds with apparent relish, and the plants are apparently distributed very largely by this agency; the hard-coated seeds passing unharmed through the bird's digestive system. If the plants are growing too close for comfort they may be eradicated either by grubbing them out or by killing them with certain of the new chemical weed killers. Whatever you do, be careful. Remember that it pays to be well acquainted with this poisonous trio—and by all means respect them.

. . . *The End.*

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## SPORTSMAN'S MAP AVAILABLE

The Commission's popular Sportsman's Map of Pennsylvania which has been out of print for some time, has recently been revised, and the new up-to-date version is now available. A small black and white reproduction of the map appears on the back cover of this issue.

Approximately twenty-four by thirty-six inches in size, the new map shows State Game Lands, State Forests, Game Refuges, Co-operative Farm-Game Projects, Archery Hunting Preserves and many other features of interest to hunters and anglers. State highways, secondary roads, streams and county lines are also marked.

Drawn to a scale of about  $9\frac{1}{3}$  miles to the inch and embellished with a decorative border of wildlife portraits the map lends itself admirably to framing. Game Lands, State Forests, etc., are shown in color.

The Sportsman's maps are priced at fifteen cents each, and will be given free of charge with each subscription to GAME News of two or more years.



SCS Photo by Edminster

*From this seven acre wildlife pond, built in 1949 and rebuilt in 1950, seventy-two muskrats were trapped in 1951. At least three broods of wood ducks and two of blacks or mallards were raised on the pond this same year.*

## New Deal for Ducks

By Keith C. Schuyler

ON THE heels of the successful farm fish ponds that have delighted anglers and conservationists over the country, a relatively new idea is being developed which has a special appeal for the hunter-conservationist.

Wildlife ponds, the new development, holds the answer to many problems facing the man with the gun. But the biggest return will be in more ducks.

In addition to improving the sport of upland game shooting, wildlife ponds offer countless recreational by-

products which include wildlife and wildlife cover, trapping, nature study and soil and water conservation. However, the greatest advantage to the hunter is in the production and attraction of waterfowl. This is particularly important to gunners in most parts of Pennsylvania who would like better duck shooting.

Sometimes referred to as wildlife marshes, the ponds offer many advantages to the farmer as well as to the sportsman. In New York State, where a program was instituted three years ago, and where ninety-two

onds were built last year, game and conservation officials are enthusiastic over the results to date.

Wildlife ponds differ considerably from farm fish ponds in that depth of water is of little consideration, and fishing that is provided is only incidental to the general advantages. They differ, too, in size. Whereas a one-acre farm pond may be considered of good size, wildlife ponds are seldom less than two acres and have been constructed to encompass as many as thirty-five acres. Again, where farm ponds are constructed to discourage the growth of vegetation in deference to the fish the owner hopes to raise, wildlife pond bottoms are frequently cultivated to encourage the growth of food plants conducive to the propagation of waterfowl.

Selling the property owner on the establishment of wildlife ponds is not the chore today that it might have been twenty years ago. Diminishing water tables over the country, and the rising threat to areas where the table has remained fairly constant, makes addition of a pond of any nature of value to any property.

If constructed close to farm buildings, the pond offers fire protection by creating a readily available water supply. It provides water for stock throughout the year, and since vegetation is encouraged, the pond area provides refuge for upland game and a haven for waterfowl. Some owners have profited considerably from muskrat trapping.

Construction of a wildlife pond, or marsh, proceeds much as in construction of any type of dam, except that it is likely to be considerably less expensive. Selection of a site is important, since a natural basin can, of course, be dammed much cheaper than an area which requires extensive excavation.

Stripping of the topsoil and part of the subsoil from the dike site is important. The water control structure is then installed and a core of

impervious clay is recommended along the entire center line of the proposed dike before the earth fill is added. A one-quarter inch to one-half inch hardware cloth apron should be buried about a foot beneath the sloping bank of the dike on the pond side and should be extended for about thirty feet on both sides of the headwall of the water control structure. This provides protection against muskrat tunneling.

Of course, the dike should be built a few feet higher than the proposed water level to guard against floods. An emergency spillway, always important in any dam, will handle normal flood waters and prevent the dike from washing out.

Before the dam area is flooded, it should be plowed or disced where possible to provide a seed bed for marsh plants.

As to cost, it is interesting to note that the average cost for twenty-seven small marshes built last summer in New York State was \$271.

While the Pennsylvania Game Commission recognizes the construction of wildlife ponds as a worthwhile wildlife conservation practise, because of the demands of other phases of food and cover work it cannot at present include these ponds in its land utilization program. However, the Soil Conservation Service of the U. S. Department of Agriculture makes technical assistance available in soil and water conservation to farmer cooperators of locally-organized soil conservation districts, of which there are 28 in Pennsylvania. The Service furnishes technicians who work with farm owners to develop a complete soil and water conservation plan for the farm.

The Production and Marketing Administration of the U. S. Department of Agriculture has a branch known as the Agricultural Conservation Program. Their monies are appropriated to pay a portion of the costs of the installation of various



SCS Photos by Edminster

*Site for shallow type impoundment to make a wildlife pond, now covered with sedge and some brush. Below—Laying tube for drop-inlet from concrete base.*

soil conservation practices on farms. Assistance in paying for the construction of farm ponds that are designed to provide water for livestock management and irrigation is usually included in these programs.

However, although some financial assistance might be obtained, the relatively low cost of wildlife ponds in proportion to the benefits available makes such a project a good investment without such assistance.

Sportsman's clubs, which many times spend hard-earned money to stock game on lands which won't support it, might find concrete returns on their investment in a wildlife pond. If the club doesn't have land available, a cooperative project might be worked out with a farmer. In return for hunting and fishing privileges, the club could underwrite the cost of a pond for a farmer. The farmer, interested in land and water



that is still his property, would certainly serve as a constant guardian of the club's investment.

This writer has been advocating wildlife habitat improvement over indiscriminate stocking for a number of years. It simply does not make sense to expect game to reproduce where it has no natural protection from its enemies and an available food supply.

Our own Game Commission has been forced to adopt a program of stocking game immediately before and during the hunting season to meet the *demands* which exceed the supply of game that can be supported by the land in its present condition. This is done, of course, in the knowledge that hunters' guns will act as an equalizing factor.

An article of this length cannot be expected to provide all the information necessary for a reader to go right out and build a wildlife pond. (See notes at end for sources of such information) However, it is intended to create the desire for such a project. Although the preceding paragraphs were written with this intent, the burden of proof and necessity for the project rests with the writer.

So, let's look at it from purely an objective standpoint . . . on the basis of hunting alone, since this is the official organ of the Pennsylvania Game Commission. For a dissertation on wildlife ponds to deserve a place here, despite the other varied benefits they produce, we should be able to prove that wildlife ponds can and will improve hunting and its allied sport, trapping.

You have only to look back at the past hunting season and think where you found the most game after the first few days of the season. Almost invariably your memory will take you to a brushline stream or marsh. It is there that the ringnecks head almost as soon as the shooting begins.

Even the rabbits, though they often prefer to sit in the open fields, choose a spot near heavy cover or a groundhog hole. The few quail that we have left can usually be flushed from or near the heaviest thickets. But, it is not only the brushy thickets that attract the game, it is the constant supply of water in or near the thickets which assures animals and birds of a ready drink without exposing themselves.

Foxes are usually found in brushy areas because that is where they can most easily find the living creatures that form their diet.

And ducks . . . that brings us to the most important argument in favor of wildlife ponds. Pennsylvania long ago fell flat on its face with regard to duck shooting. Some recovery has been made in state propagation areas, but, generally speaking, the duck has gone with draining of the rearing areas by expanding civilization.

The one happy exception in regard to ducks has been in the recovery of the wood duck through erection of nesting boxes in a program sponsored by the Game Commission. But the relatively tame woodie cannot withstand the shooting to which he is subjected by duck hunters despite the limit of one duck a day.

So, if we are to have a return of good duck hunting to this state, we must do something about it. Cleaning of our refuse ridden and sewage saturated rivers will help, but establishment of semi-secluded rearing ponds will accomplish much more.

Once all states become "pond conscious," return of good duck shooting everywhere is almost inevitable. And, the relief to the heavily hunted areas through spreading of the guns over a wider section of the country, will help to hold the slipping population of ducks that regularly tours the well-watered flyways.

Duckographically speaking, Penn-

sylvania is not on any of the principal migration routes. Our best duck shooting occurs when storms force waterfowl away from their scheduled routes or passing flocks descend because of storms or fog. Most of our best shooting, other than the "native" quackers and the relatively few ducks which normally migrate through the state, occurs when storms along the east coast force the flights inland from the main Atlantic flyway.

Native ducks are confined mostly to the colorful woodies, a few mallards and a scattering of blackies.

However, the nesting range of all winged creatures is adjusted to living conditions in the same manner as animals adjust their habits to food and cover. Both deer and beaver were extinct in some areas of this state only a comparatively few years ago. Yet both have increased almost to pest proportions in these same areas today.

If sportsmen and farmers of Pennsylvania concentrate on providing wildlife ponds, they won't have to search for wild residents to take over the natural homes that are provided.

Although wildlife ponds are relatively new on the conservation scene, early experience has shown the benefits possible. In one observation of six ponds, of which four had water in them for the first time in 1951, and two had water in them for two years, a counted total of 14 broods of wild ducks were raised and there were indications that six more were probably raised. Roughly, that is one brood for every two acres.

These ducks were blacks, mallards, blue-winged teal and wood ducks.

Since a conservative average for these species would indicate from 8 to 13 ducklings to a brood, the crop of ducks produced by the 40 adult ducks would be approximately 160 to 260.

Taking the average figure of 210 ducks, and estimating a survival of but 20 per cent after toll by predi-

tors, hunters and other causes, 42 ducks should survive. These ducks produced from but 6 ponds, should reproduce at the very least 210 ducklings the following year on the bases of five ducklings for each survivor from the original 210.

Although these figures are all hypothetical, with the exception of the 20 pairs of ducks that actually existed in the example given, I believe they are on the conservative side.

If you have read closely, you will see a net gain of but 10 ducks, after losses, over the first year. But, if this gain were multiplied by the building of but one wildlife pond in each of the state's 67 counties, on the basis of but 10 ducks to each six ponds, we would have a first year increase of 111  $\frac{2}{3}$  ducks.

You take it from there; I never did like mathematics.

However, if this doesn't sound like much, check back a few paragraphs. Remember, we allowed a mortality rate of 80 per cent. And, somewhere in that 80 per cent is a lot of good duck shooting. Of course, not all these ducks would be shot by state hunters, but if all neighboring states adopted the wildlife pond project, the shooting would be even better.

On the basis of ducks alone, I believe we have a good argument for wildlife ponds. The countless other advantages would be extra dividends in sport, recreation and CONSERVATION.

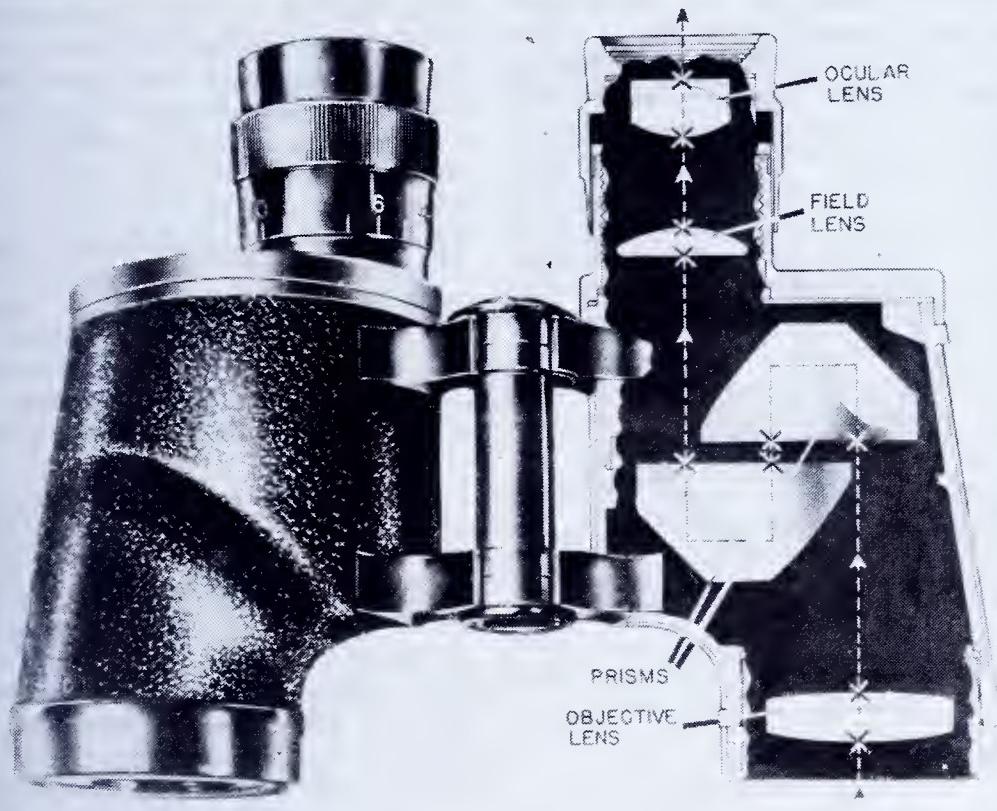
Those wishing additional information on wildlife ponds, may refer to the agencies below to whom I am indebted for much of the data upon which the preceding was based:

United States Department of Agriculture, Soil Conservation Service, Upper Darby, Pa.

Conservation Department, State of New York, Albany 1, New York.

Wildlife Management Institute, Washington, D. C.

. . . *The End*



*Standard individual focusing prism binocular. "X's" mark the 10 optical surfaces where undesirable reflections occur. It is these surfaces that are coated to reduce reflection.*

## *Know Your Binoculars*

By Robert J. and Elsa Reichert\*

ON ANY field trip you see birders using many different kinds of bird glasses, and sometimes you are surprised to find that the most expensive glass is not the one you prefer. Probably it is not the type that is best for you; or perhaps it is merely no longer functioning properly. To see the birds clearly—and that's why you're out birding—you need a glass that suits you personally, and is in good condition.

### Magnification (Power)

Your binocular should "bring the birds up close," and show clearly details of markings and color. How close? A 6x glass magnifies 6 times; it makes a bird at 600 feet seem only 100 feet away; and one at 60 feet seem only 10 feet. An 8x glass brings them closer, and a 10x nearer still; but the bird may appear less clear. Any vibration of your hand holding the binocular is magnified as much

\* This article was originally prepared by Robert J. and Elsa Reichert, of the Mirakel Repair Co. for *Audubon Magazine*. Permission to reprint has been granted by that magazine.

as the bird. If this vibration is magnified too much, the bird will seem to "jump around" to such an extent that it will appear blurred and cause eyestrain. Some experienced ornithologists use a 6x or 7x glass for general birding, and a 10x or more for special work; but it requires very steady hands to use such high magnification (high power) glasses successfully. Usually 6x or 7x, or at the most 8x, is recommended for restful vision.

For some purposes a low power field glass is adequate. The term "field glass" should be applied to a glass without prisms, and the word "binocular" to the prismatic type. Field glasses come only in low magnification, usually not over 4x or 5x. This is sufficient for very short distance observation, such as birds near the house; for longer distances you require 6x or 7x to show details you want to see.

### Light Transmission

*Exit Pupil.* To distinguish colors and fine markings, even when the day is dark or the bird is in shadow, you also need good light transmission. You want a glass that lets through a good deal of light. Some glasses let through much more than others. Light enters the binocular through the objective lens—the "window" of the binocular—and naturally a large objective lens lets in more light than a small one. The size of the objective (its diameter) expressed in millimeters (mm.) is the second numeral used to describe a binocular. A 7x35 has a 50-mm. objective, which being much larger, therefore lets in a great deal more light. You can check the light transmission of a binocular quite easily: hold the binocular 8 to 10 inches from your eyes, pointed towards the sky, and look at one of the ocular lenses. In the center you will see a circle of bright light—the cross-section of the beam of light coming out of the binocular. This circle of

bright light is called the "exit pupil," and its area is a measure of the light transmission.

Comparing two binoculars with the same magnification (7x35 and 7x50), the one with the larger objective (7x50) has the larger exit pupil, and therefore greater light transmission. Comparing two binoculars with the same size objective, but different magnification (6x30 and 8x30), the lower power glass has the larger exit pupil, and therefore greater light transmission, which is another reason for using low power binoculars.

Unfortunately some binoculars are dishonestly built. The objective lens may be large, but behind it is a diaphragm that cuts down the size of the opening, much the way pulling down a shade cuts down the light coming through a window. However, you can easily detect this in any binocular: compare its exit pupil with the exit pupil in another binocular of the same type (same magnification and same size objective), which you know is honestly marked.

*Coating.* Before the war the size of the exit pupil was all you needed to know about the light transmission of a binocular. Today there is another factor: its brightness. After the light enters the objective, it passes through various lenses and prisms, and a good deal is "lost" by reflection from the surfaces of these glass parts. At each surface the loss is about 5 per cent, and as there are at least 10 such surfaces (on each side of a binocular), the total loss is considerable.

Science has now found a way to prevent so great a loss by means of a new process called *coating* (or *hard-coating*). The glass surfaces are treated to reduce the reflection of light to only about  $\frac{1}{2}$  per cent (instead of 5 per cent) per surface. Much more light gets through the binocular—about 50 per cent more if all the required surfaces are coated. Of

course, this increased brightness is of greater value to you on dark days, or when the bird is in the shadow; then greater brightness means seeing colors and markings clearly instead of only dimly.

Strange as it seems, coating helps, not merely when the bird is in poor light, but when it is in brilliant light as well, but for a different reason. When the bird is in bright light, or silhouetted against a bright sky, the multiple reflections inside an uncoated binocular cause a glare that tends to blur vision. You've seen such blurring of vision in a store window when sunlight reflected from the window makes it impossible to see clearly the display behind the window. Much the same thing happens in a binocular, except that instead of two reflecting surfaces you have many more—at least 10. Coating these surfaces, because it reduces the reflections until they are negligible, enables you to see birds clearly, even when looking in the direction of, but not into, the sun.

So greatly does coating increase the clarity of vision of a binocular—both in dim and in very bright light—that all modern high-grade binoculars come with coated optics. Some of the less expensive glasses that call themselves "coated" have only a few—not all—of the surfaces processed, but even this is a help. How can you tell whether a binocular has coated optics? Look at the objective lenses: if they have a bluish or purplish tinge, they are coated. If you have any doubt, compare them with uncoated lenses; their appearance is quite different. However, this only tells you that the objectives are coated; you have no way of knowing how many of the inner surfaces of the binocular are coated.

Fortunately, you need not buy a new binocular to have a coated glass. If you own an uncoated one, you can have the lenses and prisms

processed; but make sure the work is performed by an outfit that you know will coat all the required surfaces.

It is well to remark here that field glasses (non-prismatic glasses) are not much improved by coating. They have only four surfaces (on each side), instead of 10, so that not very much light is lost by reflection. Furthermore, the objectives are usually large enough and the magnification low, so that the light transmission is high.

#### Field of View

When watching birds, a wide field is a help. Field of view is the width of scene visible through a binocular. Width of field is usually measured at a standard distance from the observer—1,000 yards away. The width of the field is usually quoted in feet.

Field of view depends partly on magnification: Comparing two binoculars of the same design and different magnification, the glass with the lower magnification has the wider field of view. A standard field 8x has a field of about 330 feet, and a standard field 6x a field of 445 feet. There are 8x binoculars with a 445-foot field; these are wide field glasses and differently designed. The part of a binocular that determines whether it is a standard field or wide field instrument is the ocular system—especially the field lens. In a standard field binocular, the ocular system consists of only two lenses, one of them a small field lens. In a wide field binocular, the ocular system is complex, consisting of three lenses, one of them a large field lens. This complex design is costly to make, and that is why true wide field binoculars are usually high-priced.

We say "true" wide field, because there is much false advertising on this subject. Most low-price binoculars are called "wide field," although the field is only standard. How can you tell whether a binocular has a wide field? One way is to get this

specification when you buy a glass—the number of feet seen at 1,000 yards—and compare it with the figures shown in the table. Another is to compare the binocular with a glass of the same magnification and known field of view. Look at something that is easily measured, such as a distant building with many windows, and count how many windows you see through each glass.

You may come across an untrue claim about field of view often found in ads. As above explained, the width of the field is determined by the size of the field lens. The objective lens has no effect whatever on field of view, and any claim that a large objective produces wide field is wholly false. A large objective, as previously mentioned, lets a great deal of light into the binocular, and that is its only advantage.

### Field of View and Eyeglasses

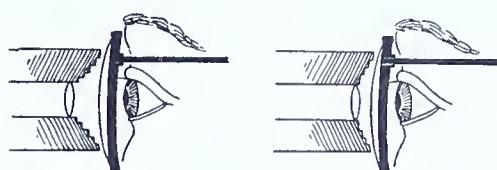
If you wear eyeglasses you have a special problem as regards field of view. Binoculars are designed for use without eyeglasses. When you hold the binocular so that the eyecaps

then you get an appreciable smaller field of view. It is not practical to take off your eyeglasses every time you use your binocular; there is a better solution. Eyecaps are usually deep so that the ocular lenses are about 11 mm. from your eyes when you use the binocular without eyeglasses. They can be made shallow (flat), so that when you use the binocular with eyeglasses, the ocular lenses are close up against your eyeglasses—and about the correct distance from your eyes for maximum field of view. The increase in field thus obtained is quite surprising.

### Choice of Models

It is in the matter of field of view that a field glass is notably less satisfactory than a prism binocular. Although the magnification is only 4x or 5x, the field is considerably less than in a 6x binocular. That is why, apart from reasons of economy, the field glass is seldom chosen except for work at very close distances. It is somewhat easier to use than a binocular, and for that reason as well as its lower cost, it is particularly suitable for children.

When selecting a binocular, bear in mind that there is no binocular made, irrespective of price, that is ideal for all purposes. So you must decide what features are most important to you. If you are going to watch birds mostly under very dark conditions, such as at dawn or dusk or in deep shadow, then you need the 7x50 with its very large objectives—of course, with coated lenses and prisms. Its tremendous light transmission makes this model a must for work under such extremely unfavorable light conditions. To be sure, this glass is large and bulky—large objectives mean large prisms and large overall size. If smallness and compactness mean more to you than brightness, then you may pick a pocket binocular, which necessarily has small objectives. You may compromise on a 6x, 7x or perhaps an



*Normal binocular eyecap when used with eyeglasses (left) holds eye too far away from ocular lens for maximum field of view. Shallow eyecap (right) positions the eye at the proper distance.*

are close to your eyes, as is normally done when no eyeglasses are worn, you get the maximum field obtainable with that particular binocular. If, however, you hold it so that the eyecaps are further from your eyes, as happens when you wear eyeglasses,

8x binocular, with objectives not less than 30 mm. No matter what model you decide on, you naturally prefer it to have coated optics.

As for field of view, the standard field 6x has all the field you need for bird study; the 7x, of course, has somewhat less. A disadvantage of standard field in 8x and 9x binoculars is their small field. If you want such magnification, you will undoubtedly choose wide field models, if you can afford them. Before deciding on any binocular, it pays to try it out on a birding trip, and if possible compare it with other glasses, to make sure it really suits your personal needs.

It is truly a joy to use a binocular when you can "pick up" a bird quickly, and see colors and details clearly—and without eyestrain. For such vision you must use the glass correctly, it must be the right mechanical type, and above all, it must be in good condition.

Only you can focus the binocular for your own eyes, and you should do so carefully before you leave on a bird trip. To focus, you need a printed sign to look at. Select one at least a couple of blocks away. For best results, rest your elbows on something solid, then depending on which mechanical type of binocular you are using, proceed as follows:

#### Individual Eyepiece Focusing

This type has two calibrated eyepieces that are focused separately. First, turn both eyepieces as far out as they will go. Next put the binocular to your eyes, close your right eye, and look at the sign through the left side, turning the left eye piece until you can read the print clearly. Use the same method to focus the right side. Then bend the hinge adjustment until your eyes look through the center of each ocular lens. Note carefully the marking where each eyepiece is set so that, if it is moved, you can put it

back in correct position without looking through the binocular.

Your binocular is now correctly focused for the sign, and also for objects moderately close to you. How close you can see clearly depends on two factors: the magnification of the binocular and the condition of your eyes. The lower the magnification, the closer you can see clearly without changing the setting of the eyepieces. Eyes vary greatly in their ability to see close up, one's age being the chief factor. Your eyes can "accommodate" for near vision; as you grow older your eyes gradually lose this ability. When looking through your binocular at a near object, if it looks blurred, turn the eyepieces, as already described, until you see clearly.

This type has a focusing wheel on the hinge post, and a calibrated right eyepiece. The left eyepiece is not adjustable. First turn the focusing wheel until the bridge supporting the two eyepieces is as far out as it will go, and turn the right eyepiece as far out as possible. Next, put the binocular to your eyes, close your right eye, and look at the sign through the left side turning the center focusing wheel until you can read the print clearly. Then close your left eye, and turn the right eyepiece until you read the print clearly. Bend the hinge adjustment until your eyes look through the center of each ocular lens. Note the marking where the right eyepiece is set, so that if it is moved, you can put it back into correct position without looking through the binocular.

When looking at a near object, if it appears blurred, refocus as follows: keep both eyes open, and turn the center focusing wheel until you see the object clearly. Do not move the right eyepiece, as once you have set it correctly, it is correct for all objects, far or near. In fact, if you and you alone are going to use your

binocular, it might be a good idea to fasten the right eyepiece in place with a bit of Scotch tape.

### Advantages of Each Type of Focusing Mechanism

*Individual Focusing.* Once you have set the eyepieces correctly for your eyes, they are correct for all reasonable distances—from the far distances to as close as 50 to 30 feet. If you never look at nearer objects, this is the type of focusing mechanism for you. Once you have set the eyepieces, they are set for life, and you can fasten them in place with Scotch tape. If you watch birds as close as 25 or only 15 feet, you will find this type inconvenient. Refocusing each eyepiece separately is slow.

The individual focusing mechanism can be fairly well sealed, so that moisture and dust do not easily get into the binocular. That is why the hunter—who never observes objects closer than 50 feet and values durability—prefers this type. Military binoculars, which must take a heavy beating in all kinds of climate and weather, are always individual focusing.

For observing close-up birds as well as those far away, use this type of binocular. Before you leave on a bird trip, make sure the right eyepiece is set correctly; then all you need to do to see birds clearly—whether far or near—is turn the center focusing wheel. Thus you can follow moving birds easily.

How close you can focus your binocular depends on several factors. Generally speaking, you can focus nearer with a low power binocular than with one of higher magnification, but instruments vary considerably. You may even find that one binocular can be focused closer than another glass of the same model and made in the same factory. If you have a choice, pick the glass that focuses closer.

As for sealing against moisture

and dust, this cannot be done effectively with center focusing construction. The ocular tubes slide up and down, and must necessarily fit fairly loose or they would jam; certainly they cannot be sealed. And advertisement claiming central focusing glasses to be "sealed" or "water-proofed" is obviously false.

In the focusing instructions above outlined we assumed that if you see clearly through each side of a binocular separately, you can also see clearly through both sides at the same time. This is true only when the two sides are perfectly aligned. If the binocular is "out of alignment," one side points at a somewhat different spot than the other. Looking at two different views at the same time puts an unreasonable burden on your eyes. If the difference is great, you will find it impossible—you will not even try—and so will suffer no eyestrain.

But, if the difference is slight, your eyes will attempt to fuse the two different images. This produces various effects. The object you look at may appear blurred. It may appear to flicker, as one or the other eye tires from the strain and stops seeing the object. Eyestrain is certain and a headache may result.

Correct alignment is essential for clear and restful vision, and if your binocular is not easy on your eyes, it should be checked for alignment. If you cannot do this yourself, send it to an organization qualified to check it, and to align it accurately if needed. To achieve precision alignment—whether in factory or repair shop—a special instrument known as a "collimator" must be used and the reason for its use is a curious one.

Bear in mind the hinge adjustment of a binocular. When it is bent closed, the eyepieces are close together, in position for eyes that are close together; when the hinge is

wide open, it is set for eyes that are far apart. A binocular should be in correct alignment for all hinge positions—correct for all eyes. To achieve correct alignment for all hinge positions a precision testing instrument is absolutely necessary. A practiced aligner can easily align a binocular "by eye" alone for any one position of the hinge, but he cannot do so for all positions. To accomplish this he must use a collimator, and it must be properly designed and very accurately built.

Few people realize how many new binoculars are more or less out of alignment when offered for sale. Perhaps the factory collimator was not well designed or not accurately made, or perhaps the aligner was careless. Possibly some optical or mechanical part in the binocular shook loose during shipment, and this caused misalignment. When buying a binocular, check it for alignment if you can; if not, and you have any doubt, have it checked. For to you, as a bird watcher, precision alignment is especially important. You often look through your binocular continuously for long periods at a time; a poorly aligned glass causes eyestrain—restful vision is for you indispensable.

Of course, you should make sure your binocular stays in alignment. It should be checked from time to time. When sending it for realignment, make sure the people to whom you send it have a precision collimator.

### Clean Optics

A binocular may be correctly focused for your eyes, and in perfect alignment, and yet may not give you clear vision. The lenses and prisms may have become dirty. You cannot see clearly through a dirty window, which has only two surfaces on which dirt has settled. A binocular has at least 10 glass surfaces (on each side); if dirt or moisture has settled on

them, vision is more or less obscured.

This is easily checked: hold the binocular about 10 inches from your eyes, in reverse position, with the ocular lenses away from you and pointed towards the sky. Look into the binocular, not through it. You will plainly see any dirt that may be on the inside optical surfaces.

### Proper Handling and Care

*Cleaning.* Keep your binocular clean. Wipe off any dirt on the metal parts, especially the sliding ocular tubes and adjustable eyepiece, so grit does not get into these moving parts and cause wear. When cleaning the lenses, be careful not to scratch them. Dust particles are harder than a glass surface, and should not be rubbed into it. So, before wiping, blow off all the dust you can. For wiping use a perfectly clean linen handkerchief, or a new cleaning tissue; never use either more than once. To remove stains and smears, breathe a film of moisture on the lens; or put a couple of drops of alcohol on the wiper. When your binocular is not in use, keep it in its case away from dust or moisture.

Never attempt to take your binocular apart to clean it inside. This is a job for an expert, properly equipped, because cleaning necessitates realigning. If your binocular is not coated, this is the most economic time—when it is taken apart for cleaning—to have it coated. Be sure, however, that the people doing the work can be relied upon to coat all the lenses and prism surfaces that should be processed, for you cannot check the inside ones yourself. Your binocular's increased light transmission from a combined cleaning and coating job will astonish you.

### Maintaining Alignment

For a binocular to be in perfect alignment, all the mechanical and optical parts must be in precisely the correct position. The displacement of

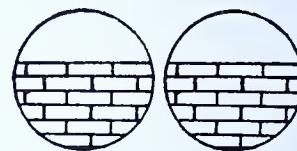
almost any part, even if only slight, will affect the alignment. Don't bump or jar your glass; never throw it down, even when in its leather case. When you wear it around your neck, keep it from bouncing around. Especially when climbing, it is wise to button your coat or shirt around the binocular, to prevent bumping into rocks or trees. A binocular is a finely adjusted scientific instrument; only if treated as one will it serve you well.

### Relative Importance

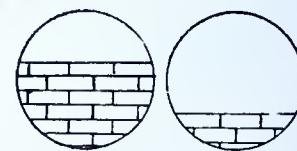
Your binocular can bring the birds up close, and show them distinctly, without being an expensive instrument. You can obtain the magnification you need for general use—6x to 8x—at a moderate price.

With a magnification not over 6x or 7x, you will find the standard field of view ample; in fact, wide field is rarely made for these magnifications. With an 8x, or higher, a field wider than standard is helpful, both for locating the bird quickly, and in keeping it within your vision during flight, but wide field is expensive. It is a pleasant luxury, but it has no effect on clarity—your prime consideration.

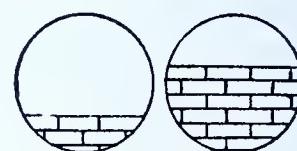
Good light transmission is worth paying for, if you can afford it. It helps you see colors more clearly under dim lighting conditions. You can obtain high light transmission by very big objective lenses, but this means an inconveniently large and bulky binocular. A better way is by objectives of moderate size, and coated lenses and prisms. With coated optics, objectives of 30 mm. to 35mm. will transmit all the light you need for any daytime use. The darker the day, the deeper the shadow on the bird, the more you will appreciate the increased light transmission due to coating. But you can get along quite nicely without



**When the view seen through the left side of a binocular is the same as the view seen through the right side, the glass is in alignment.**



**When the view seen through the left side of a binocular is different from the view seen through the right side (see above and below) the glass is out of alignment.**



**To check your binocular for alignment, look through it at a horizontal building top. Draw the binocular slowly away from you until the ocular lenses are about 10 inches from your eyes. While doing this keep your eyes absolutely rigid, your left eye continuing to stare through the left side, your right eye staring through the right side. You will then see two separate views, next to each other, and can compare them.**

coated optics under the usual daylight conditions.

The one indispensable requirement of your glass—whether you have a \$200 prism binocular or a \$20 field glass—is good condition. Your glass should be optically clean and, above all, in perfect alignment. Only then will it give you the clear and restful vision so essential for happy birding.

. . . *The End.*



## *Outdoor Kids*

By Hal H. Harrison

**B**ILLY and Jane know tent caterpillars best when they come out of their egg masses in early spring and build their large white "tents" in the crotches of wild cherry trees.

From the moment they hatch, tent caterpillars are makers of silk. They weave single strands as they travel from their homes in the tent to the tender young leaves, their food supply, and back to their homes again.

With hordes of these hungry caterpillars, which are called larvae, moving back and forth, the twigs become white from the many strands of silk.

The tent is a protection from the rain and the wind as well as from enemies. The caterpillars also spend nights in their tents. As they grow, they become large, beautifully colored caterpillars.

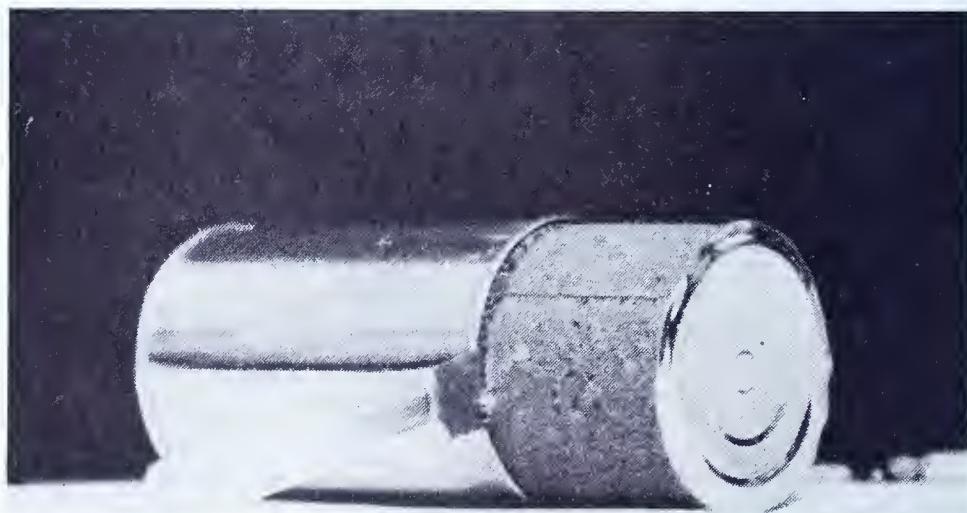
When it is full grown, the caterpillar leaves the crawling horde for the first time. Each goes its own way to search for a place to spin around itself, with silk from its own body, a snug-fitting house, called a cocoon. Inside this cocoon, the caterpillar will rest as it changes into a winged moth.

A brown moth comes out of the cocoon in early summer. The female moth places a band of eggs, laid one against the other, around a wild-cherry twig. The eggs are covered with a froth that dries like shellac. Within this covering, three hundred to four hundred eggs are protected throughout the winter.

When spring days come again, the warm sun hatches the eggs. From each one crawls a tiny, slender caterpillar, its body covered with hair. Thus another generation of tent caterpillars has been born. Again Billy and Jane can watch them come and go from their silky tents.

Farmers who destroy the wild cherry trees to get rid of the tent caterpillars often find that the pests have moved into their apple trees. Strange as it may seem, the wild cherry trees apparently do not suffer from this insect, and many farmers find it best just to leave them alone.

. . . *The End*



#### KEEPING DOG FOOD FRESH

For those who have dogs that do not require a full can of dog food each day, there is a simple and neat way to keep the remaining portion in the refrigerator without having it become dehydrated and discolored.

Simply cut both the bottom and top of the can loose on a mechanical can opener which does not leave ragged edges. Place two fingers against the loosened tin on one end and push out as much of the food as you intend to feed. Then cut it off as shown in the accompanying photo.

Remove the tin top from the severed half and replace it on top of the food remaining in the can.

The remaining portion of food will keep fresh for a long time in its original container and in its original form with no further bother.

# Outdoor Reveries

## May Magic

By John H. Day

I WALKED slowly up the open timbered slope, hoping for a rendezvous with the "hoot" owls said to be rearing a family in the wild grape tangles near the ridge. The undergrowth had been cleared by grazing sheep, turning the hillside into a wooded park, with towering oak and poplar competing with hoary-headed beech patriarchs for a place in the sun. The owl clan is equipped with marvelous hearing facilities, and I picked my way carefully, trying to avoid snapping dead twigs or crunching the dry leaves underfoot. The airy shadbush was blooming and dogwood buds were beginning to answer the lure of the warming sun.

My route followed a line fence, tracing out a path across a rocky outcrop and finally nearing the nesting area. The trees were talking big in a stiff breeze, which served to deaden the racket of my approach. I watched the woods ahead and suddenly noted a gray hulk some sixty feet up in a black oak, perhaps two feet out on a huge limb.

A shroud of grape vines helped hide the quarry but the glasses pinned it down as a big round-headed owl moping there in its hideout until sundown. I sprawled at the base of a neighboring tree and watched as the gusts ruffled its feathers and oc-



casionally threw the bird off-balance. There was no indication that the owl knew I was in the neighborhood.

Suddenly my attention was drawn to some motion in a neighboring tree and the glasses revealed the two young owlets, perched side by side, observing me with unwinking solemnity. They were nearly full-grown, but had not yet completely lost their fledgling look. Their eyes were brown, sure field mark of the barred owl, the most common big owl of our timberlands.

I moved about, trying for a better view of the old bird. She made nary a move until I crossed the low wire fence. Then she took off through the trees with the noiseless, moth-like

flight characteristic of all owls. On the instant it seemed that every crow in the township was alerted. I could follow her route by the tremendous and indignant corvine uproar.

The two little fellows sat tight, even though their mother had deserted them. They made no sound, no bill snappings, but just sat there and watched me with those big reproachful eyes. Finally I tired of the waiting game and tried tossing a stick up to their lofty perch.

A long grape vine hung down close by their third-floor apartment. I rattled this against their branch and they suddenly lost their aplomb and took off through the trees. One appeared to alight on the ground about eighty yards off, but when I hot-footed over there the owlet was nowhere to be found.

Making acquaintance of this owl trio added hugely to the enjoyment of the early May afternoon. Owls are most interesting citizens. Creatures of the night surrounded by centuries of superstition, owls have symbolized luck, magic, mystery, secrecy, calamity and prophesy. Their uncanny midnight hooting, with now and then a fearsome scream, has earned them a place in literature as harbingers of direful fate.

Leaving the woodland, I paused for a drink of delicious Adam's ale at an upland spring, then swung back down along the fence line to the roadway. The unusual owl activity had stirred the crows into tremendous ribald hullabaloo. They were all about shouting "Owl" at the tops of their lungs.

Through some quirk of fate one black fellow had lost all his tail feathers. He made a most comical sight, skidding around in the three-alarm excitement of the owl heckling. He seemed to have difficulty in balancing himself, but he got around all right, despite the fact that his rudder was gone.

The creek in the valley was running crystal clear so I trailed along through the lush bottomland growth, inspecting a few long pools and scaring up a frog here and there. There were some sizable chubs and a few suckers in the deeper pockets, and I saw two small bass, and great multitudes of minnows.

Along one eddy there had been a tremendously successful tadpole hatch. I thought at first that a dark oil scum had washed in along the muddy shoreline, but a second look revealed hundreds of tiny tadpoles scarcely a half-inch in length, crowding the shore for a distance of several yards. They must have been finding some sort of minute food supply there and they kept crowding over each other in their eagerness to get to the banquet table. One watersnake chancing along that way could probably have wiped out the whole entourage, but only at the price of a terrific case of indigestion.

Where the broad stream falls across a shallow riffle I waded through to the consternation of several crayfish, who scuttled about at a great rate. A few moments later I picked up a crawdad crawling along the roadway, many rods from the water. He was deep blue in color, from his nippers to his tail, and I suppose was one of the chimney crayfish—those fellows that bore "snake holes" along country pathways, and build mud chimney turrets about these dark entries.

Maytime is house hunting time for the burly queen bumblebees, those big black-and-yellow ladies with the mellow, breezy bass voices. During the cold months they dozed in some cozy hideaway but now their first care is a persistent search for a proper apartment in which to set up housekeeping. Any rude cavity or hole in the ground will do, so long as it can be fitted up to the queen's taste. An abandoned field mouse's nest is made

to order, and the lucky queen who finds one of these snug dens moves in promptly.

As a worker in wax the bumblebee cannot be compared to the hive bee. She is primitive and awkward in her cell-making techniques, but she pays her way by her engaging dunder-headedness and her priceless service to farmers and orchardists throughout the land. "They're lazy to look at, an' kinda' go buzzin' and bummin' around so slow," but the bumblebee is a solid citizen.

Of all the months in the colorful outdoors calendar, May is perhaps the best in which to "go forth under the open sky, and list to Nature's teachings." Even the hard-bitten Anglo Saxons knew these 31 May days as the "flower month." The heartbeat of the soil is quicker now, and every greening wildling strains at the leash to answer the call of sun and gentle rain.

The countryman notes the hurrying, searching bumblebee as part of the wayside scene in May. No matter where he stops for a "breather" while scrambling along the hillsides or exploring the thickets, one of these rovers of the underwoods soon comes zooming by, investigating every nook and cranny.

When she finds a haven to her liking, Madam Queen may bring in some soft dead grass for the nursery floor. Then she hustles out to the flower fields for some pollen and nectar. This loot she fashions into a little ball of beebread. When she gets enough beebread "baked" she lays tiny eggs on the batch and covers them with a thin sheet of wax.

In due course the eggs hatch into bumblebee grubs who start right in demolishing that delicious beebread. They eat themselves drowsy full and nod off to sleep in cozy yellow cocoons. In about two weeks there is a great stirring in bumblebee lodgings all across the old fields and meadow bottoms. New voices join the bass sec-

tion of the clover field choral society and honey production charts show a gratifying increase.

The countryman revels in the welter of bird song and the great drifts of bloom along his favorite woodland trails. From the crucible of Spring come pouring great glowing ingots of the returning season's gold. Even the fresh-turned earth in the brown furrows smells almost good enough to eat.

One who knows the outdoors makes his own appointments in May. From year to year he remembers, and needs no one to tell him what to see, what to listen for or what delights of fragrance will tantalize his nostrils. He has his own program notes and the unfolding pageantry is balm to his Winter-jaded soul. "Is it so small a thing," he says, "to have enjoyed the sun, to have lived light in Spring?"

April showers are a necessary prelude to the tremendous blossoming of the countryside, but the outdoorsman treasures those soft washday rains of May which spend a dreamy afternoon cleaning up the grass and flowers. All the shreds and tatters of Winter are washed away and the world is clothed in new and spotless livery.

One of May's first and most important jobs is the nurturing of the tiny spears of grass which have followed the gleam of April across the hills. This lush first grass is the supreme triumph of the chemistry of soil and rain and sun. Grass, not gold, is the basis of empire. Nations have become great because of an abundance of it and civilizations have perished because of the lack of it and the neglect of it.

Grass is one of God's greatest gifts to man, least appreciated, most abused. When its natural cover is removed the good earth is exposed to the ravages of wind and rain. Grass has meant sorrow, despair, exultation to multitudes. Colorful flowers and birdsong steal the show, but the

greening fields are a first order of business in Maytime.

Once the new grass is up and doing, the magic of May shows its hand in apple orchards all across the land. The matchless performance of apple blossom time, with breath-taking panorama and heady fragrance, is of the very essence of Maytime. The countryman tries to come up-wind to all the orchards in his hiking territory, with his nose far out ahead in the perfumed air.

There comes a time in May when the eager countryman finds himself so intoxicated by all the pageantry of the returning season that he drifts off into a delicious languorous binge. There are garden rows to be spaded and screens to be hung, but he wanders around in a slothful daze, as though suspended in time. Nothing matters except that Winter is over and May is here again and he intends to enjoy his Spring fever to the utmost.

. . . *The End*



Photo by Wellsboro Chamber of Commerce

During the past season more than 72,000 deer were killed by hunters in Pennsylvania, which means a lot of meat in anyone's language. Each year more and more steak-conscious hunters are seeking better means of keeping their venison in good condition. Evidence of the increased use of locker plants can be seen in the above photo of a plant in Wellsboro that contained 84 bucks.

# *Reload To Keep Shooting*

By Ed Shearer

## PART VII

FOR more than half a century reloading tools have been on the market. One of the pioneers in the development and manufacture of reloading tools was John M. Barlow, who founded the Ideal tools which the Lyman Gunsight Corporation is producing to this day. Barlow was a shooter himself and had first hand knowledge of the shooter's problems. Millions of these tools have been sold throughout the world and it is doubtful that any center-fire cartridge was ever manufactured in this country that could not be reloaded with an Ideal tool.

Apparently there is a great deal of misunderstanding among our shooters concerning the selection of reloading equipment. After reading high-powered advertisements most shooters think that the excellence of their hand loads will depend upon the amount of money spent on their reloading tools. Nothing could be farther from the truth; accuracy is dependent upon the skill and intelligence of the operator rather than the cost of the equipment.

There is ample proof that super-accurate hand loads can be produced by using the most inexpensive tools on the market. Marcy Prescott, a bench rest shooter, won the Donaldson trophy at the 1948 Johnstown (N. Y.) bench rest tournament, using hand loads he made up at the firing line by reloading the same cartridge after each round with an Ideal "nut-cracker" tool. The loads turned out with this least expensive reloading tool on the market made a ten shot group at 200 yards that measured less than an inch and a half.

On the other hand I've seen poor to fair hand loads turned out on reloading equipment with a host of gadgets that would delight any experimenter.

Commercial reloading tools on the market may be grouped into two types—the long type and the bench type tools. The latter is usually of the straight line loading design. The tong type tool is generally referred to as the nut cracker. The Ideal tool is the leading example of the tong type tool and I believe the only one on the market today. Formerly it was put out in two versions. The adjustable and the non adjustable tools. According to the latest Ideal handbook it is made only in the adjustable tool today which is a good thing.

The tong type tool has come in for a lot of criticism which is due in large part to the belief that they are relatively simple to operate. Due to its construction it requires great care to keep the various operations uniform and the seating of the bullets in a straight line. So until the beginner has acquired some skill his product is quite likely to be mediocre. The one thing that makes them popular today is the fact that they are inexpensive. One disadvantage is their slowness, requiring changes of dies for each operation. Here is where the beginner runs into grief as he neglects to use care to achieve the same precise settings each time. So instead of being simple to operate, I believe that it takes far more expert handling to achieve good results with the tong-type tools than with the bench-type which leaves both hands free to control all operations.

The bench type reloading tools of today are practically all of the straight line reloading type. In view of the advertising claims made for this type tool they are not as fool proof as some would have us believe. It is as entirely possible to go wrong with the straight line as with the tong-type reloading tools.

For example take the shooter who has an over-size chamber in his rifle and therefore desires to neck size his cases only. He would probably find it necessary to full length resize his cases to get them in the loading chamber of his tool. Modern reloading tools are cut slightly large to take care of the variation and tolerances that exist among the different makes of firearms. Now if this same tool is used by a shooter who has a minimum or tightly chambered rifle there is bound to be some amount of play in the chamber of the tool when the case is inserted. So there may be tipping of the case during the various operations which will destroy the straight line effect if not carefully guarded against.

The solution is that the hand-loader should carefully study his equipment and find out its limitations so that he can operate it intelligently. No reloading tool will do your thinking for you. There is no question that modern bench-type reloading tools are far superior to the old tong-types. The fly in the ointment is that even in the cheapest grades they cost twice as much as the tong type.

So to sum it all up the selection of the reloading tool should be based on the following: what kind of hand loads are you going to make? Will they be fired in more than one gun? How many hand loads will you average per month and how important is speed to you? As far as any individual make is concerned it's largely a matter of individual preference. I have several makes and they all do good work within their

limitations. If you reload for one gun only where neck sizing is preferred one of the more inexpensive tools will be entirely suitable for your needs.

If full length case resizing is required or a great quantity of reloads are needed you had best figure on one of the higher priced reloading tools. Of course you can get around the full length resizing problem by buying a separate full length resizing die but using this is a slow process.

Keeping the above points in mind we will take a look at some representative tools with their good and bad points, and their respective prices.

The only tong type tool remaining on the market is the Lyman Model 310 which sells for about \$10.00. This is a very much improved version of the old Ideal and has one excellent new feature—a newly designed seating punch which allows straight-line primer seating of regulated depth.

Accessories for this model include a bullet-sizing chamber which screws into the tool in the usual manner. A lubricated bullet is dropped in and a special punch follows. Closing the tong handles force the bullets through the die. Though a trifle slow in operation it will do a proper job of bullet-sizing. A muzzle-sizing die is furnished to mouth size revolver cartridges or neck size rifle cartridges. This unit can be used in connection with the inside expanding die for expansion of the case neck after resizing. Bullet seating is accomplished by a double adjustable bullet-seating chamber which allows the bullet to be seated at any desired depth. A separate hand resizing full length die must be used with the tool. This tool is greatly improved over the old model both in design, material and workmanship. It's a lot of tool for the money and although it is necessarily slow it is a good bet for the beginner who does limited reloading.

Lyman recently brought out an entirely new bench type tool called the Straight Line Jr. This is totally different from the Straight Line Sr. which is an armory press. It is a husky yet compact turret head bench press in the ten pound class and uses the same adjustable dies that are available for the tong type tools. The rotating head is self centering in any position and the head is designed so that the necessary dies for complete operations for one caliber are set up at all times. This tool is regularly furnished with a decapping chamber but no dies. The last quoted price I have is \$22.50 complete for a single caliber. Interchangeable dies may be had on order for any additional calibers.

Belding & Mull of Phillipsburg, Pa., is one of the oldest makers of reloading tools and accessories on the market today. I have used one of their first models for over a quarter of a century and it is still turning out top grade hand loads today, which speaks well for the materials and workmanship. Their newest Model 28 is quite an improvement over the older models, as it does away with the old hand bullet seater. This tool decaps and recaps in one operation with an adjustable seating depth for primers. It has interchangeable recapping shanks of different sizes with suitably shaped faces for all primers, thus solving the problem of mutilated primers. Resizing and expanding cartridge cases is accomplished in another operation. A new design utilizing lock nuts makes the changing of dies a quick operation and they hold the same adjustment. Additional dies may be obtained at low cost to adapt it for different calibers. While fitted with bullet-seating dies it does not crimp revolver cartridges. For this operation the makers suggest that it be used with their model 26 hand bullet seater. This is a very good tool for the shooter who does not demand

quantity production. It sells for around \$19.00 complete for one caliber.

The Pacific reloading tool made by the Pacific Gunsight Corp. is a bench type tool that has been on the market since 1930. This tool has a horse shoe shaped frame with a malleable cast iron base designed for bench use. An extension of one prong holds the operating lever. This tool operates in practically a vertical plane. The various dies and attachments screw into the upper arm of the horse shoe during the period of their use, eliminating the spilling of powder that is one of the faults of many tools on the market. The shell holder of the Pacific is of the rising type and its resizing and decapping die is screwed into the upper arm in proper position. The fired case is slid into the holder and the operating lever raised forcing the case into the die. This operation decaps and resizes the case either full length or neck only, depending upon the dies being used. In the case of revolver cartridges the dies remove the crimp and slightly bell the mouth of the shell in one operation, making this tool suitable for quantity production. A primer arm extends from the forward side of the tool and has a small cup surrounding the primer seating punch. The primer is placed in this cup face down and the primer holder pressed forward into the groove which is milled into the case holder and is held into position with the hand. Then the operating lever is pulled downward, extracting the cartridge case from the die by means of a suitable size expander plug which enters the case before resizing. This is drawn through the neck of the case expanding it to the desired diameter. Continued downward pressure of the operating lever forces the primer into the primer pocket. Then the operating lever is raised slightly and the arm flies forward out of the way, actuated by a spring in its base.

The lever is then pushed all the way down and the prepared shell is removed, ready for the powder. An automatic primer feed attachment is available. In the standard model a special aluminum support is clamped to the body by means of self contained screws. Into this a loaded tube is inserted. A spring stop built into the bottom prevents the spilling of the primers. The normal priming arm operates in the customary manner except that when being pushed to the rear by its spring it falls into the socket of the automatic primer attachment, allowing a primer to drop from the tube into the cup on the priming arm. When it is pushed forward to prime the cartridge case the stop spring is released, thus preventing any primers from dropping out. It is designed so that if the primer is not needed the arm can be permitted to spring back into its charging position with no double charging. Bullet seating is accomplished by screwing in an adjustable bullet seating die. You simply place a shell in the holder and a bullet in the shell mouth and raise the operating lever to its full stroke. The bullet is seated to any desired depth. The Pacific is made in two models—the standard, which retails for about \$35.00, and the Super, with a much heavier frame costing about \$10.00 more. The Super is strong enough for necking down cases, bullet swaging etc. This is a fast tool with a capacity of at least 500 shells an hour ready for the powder, and is a fine tool for the shooter who does a lot of reloading.

The Multiplex made by Jacoby & Thompson is a bit unusual because a single die is used for both neck sizing and bullet seating. It employs a universal bullet seating punch. Several accessories are available including a bullet puller. The necessary changing of parts for each operation makes it a bit slow. It sells for around \$30.00.

The Meepos is a good general purpose tool from all accounts. It seems a trifle light for heavy duty work. It is particularly adapted for revolver cartridges but will handle all kinds. There is provision made for semi-automatic priming. It retails for about \$30.00.

The Schmitt tool is of unique design in that it is one of the few rugged tools that is operated by a true horizontal swinging lever. It has plenty of power for full length case resizing, and handles large caliber cartridge cases with ease. It has automatic primer feed. Its chief drawback is that it is not designed to readily accept accessories such as bullet pullers, crimp removers or bullet-swaging dies. This tool has a good production potential and retails for around \$40.00.

Easton's big giant is a very powerful bench tool of simple design. It is made from square sections of tool steel. The primer seating arrangement is not too good because the small space makes the insertion of the primer difficult. Price runs about \$32.00.

The Jordan bench tool is of very neat turret head design and can be set up to load two different calibers without change of dies or adjustments. There is ample power for the full length resizing of the toughest rifle cases. The only complaint I've ever heard from users is the rather complicated system of changing dies, especially with the die controlling headspace for rimless cartridges. It is therefore at its best when set up for two calibers with infrequent die changes. The price of this tool is about \$35.00, less dies which cost \$21.00 per caliber. Makes it a mite expensive for the shooter with several guns.

The Hollywood line embraces the Model B. This is a massive tool which can be set up complete for five calibers with space left for a powder

(Continued on page 35)

# York County

## Twenty-first in a Series

*Note: This center sheet can be removed if desired, without damaging the magazine, by loosening the two center staples.*

### Land Area

The county contains 584,960 acres, of which 158,515 acres are forested. 426,022 acres are in farm lands and publicly-owned lands comprise, 2,812 acres, of which 1,324 acres are State owned.

### Topography

With the exception of a few mountains York county consists chiefly of gently rolling agricultural lands and small woodlots. Wooded bluffs line the rivershore over much of the county's eastern border.

The county is drained by the Susquehanna River and the Yellow Breeches, the Conewago, the Codorus and the Muddy Creeks.

### Transportation

Railroad transportation is furnished by the Pennsylvania, the Western Maryland, and the Maryland and Pennsylvania railroads. The Lincoln Highway (U. S. 30), U. S. Route 111, and other important routes traverse the county, which has 1,013 miles of improved State highways.

### District Game Protector

Stephen C. Mace, R. D. 1, Manchester, has jurisdiction over Fairview, Monogaham, Carroll, Franklin, Newberry, Warrington, Washington, Conewago, Dover, and Manchester townships.

Earl E. Geesaman, R. D. 8, York,

has jurisdiction over Paradise, Jackson, West Manchester, Spring Garden, Penn, Heidelsberg, North Codorus, York, Springfield, West Mannheim, Mannheim, Codorus and Springetsbury townships.

Daniel H. Fackler, R. D. 1, Windsor, has jurisdiction over Hellam, Windsor, Lower Windsor, Chanceford, North Hopewell, Shrewsbury, East Hopewell, Lower Chanceford, Hopewell, Fawn, Peach Bottom townships.

### Fish Warden

John S. Ogden, supervisor, 242 East College Avenue, York.

### Agriculture

Very fertile soil, including a rich limestone belt, produces excellent crops, making York one of the State's top-ranking agricultural counties. It ranks second among counties of the State in the production of chickens, eggs, corn, winter wheat, tobacco, swine and in the number of farms.

### Industry

York county's chief mineral product is crushed limestone for roads and concrete. Portland cement is also made from local stone, roofing granules are made from slate quarried in the southeastern part of the county, and local clay is used in the manufacture of bricks.

Among its chief products are machinery and parts, cigars, chains, wire, furniture, grist mill products, silk and rayon goods, clothing, electrical machinery, safes and vaults and agricultural implements.

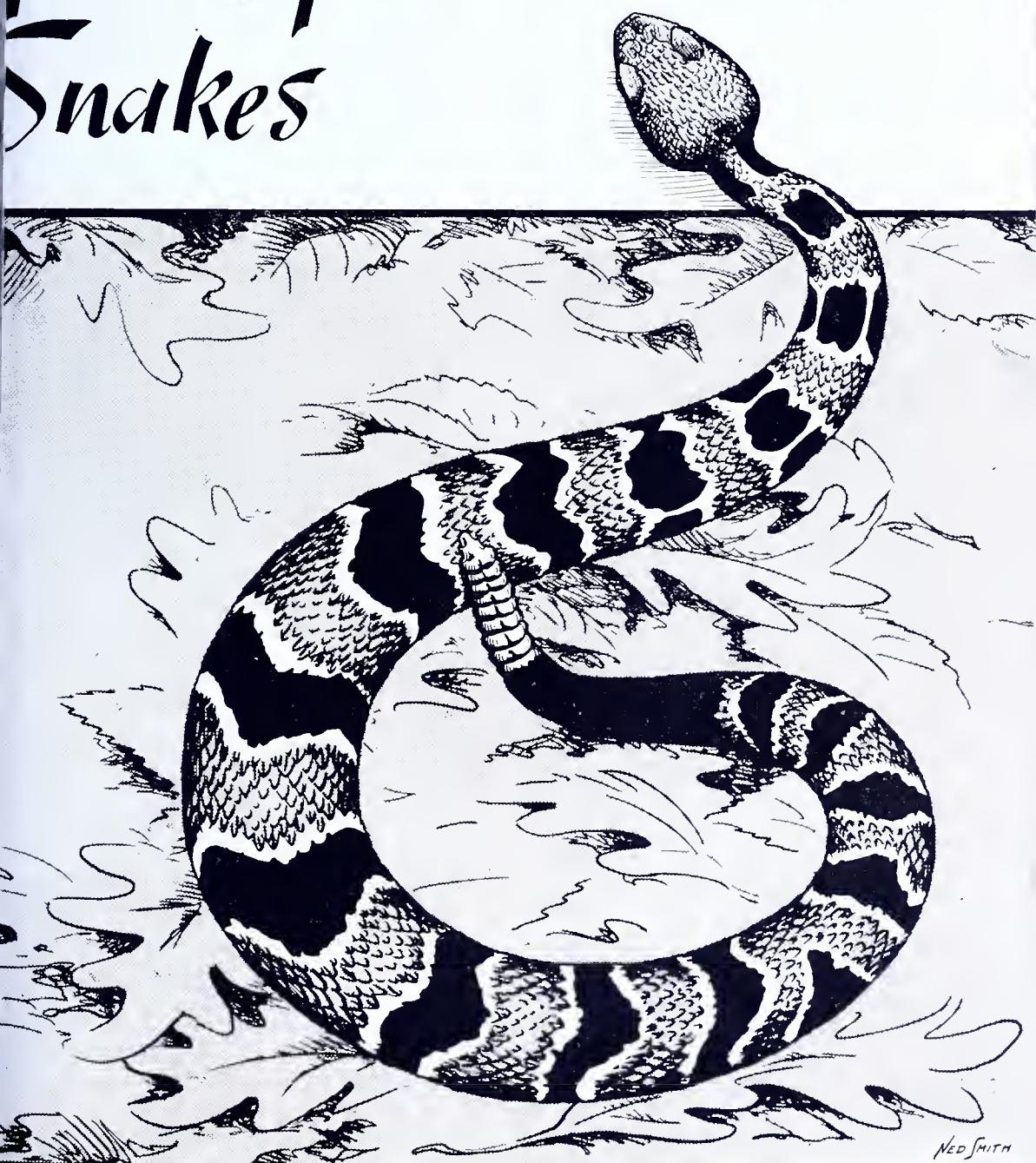
### Historic

Prior to the Revolution the region was settled largely by Germans and Scotch-Irish. A treaty of 1736 ex-



# Some Pennsylvania Snakes

"Game News"  
Conservation  
Education  
Pamphlet



PENNSYLVANIA GAME COMMISSION  
HARRISBURG, PA.

May, 1952

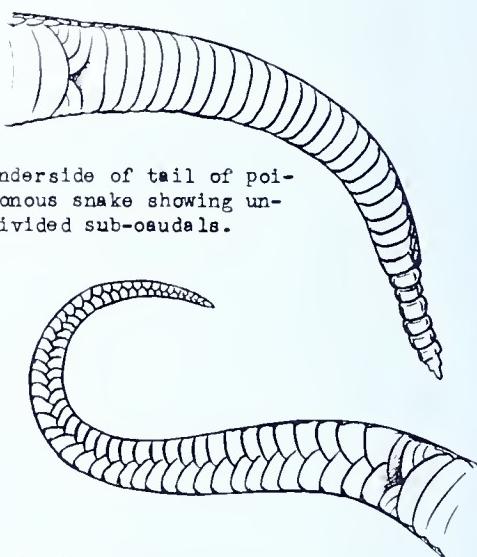
# Some Pennsylvania Snakes

OF all the wild creatures found within the boundaries of our state none are so hated, feared and misunderstood as our snakes. In spite of the fact that most are harmless and practically all are an economic asset, prejudice, superstition and lack of knowledge concerning their habits continue to indiscriminately brand as villains the entire snake tribe. Only three poisonous snakes are found in Pennsylvania—the northern copperhead, the timber rattlesnake and the massasauga, the latter a small rattlesnake confined to the extreme western part of the state. The remainder are harmless to man.

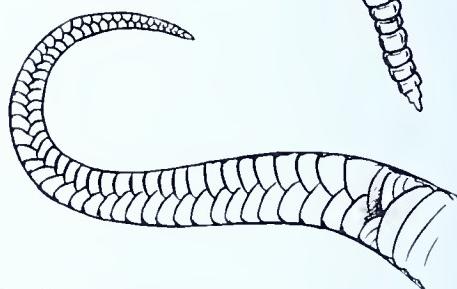
The bite of a poisonous snake is a dangerous thing, however, and its seriousness cannot be overemphasized. Fortunately, a few precautions will practically eliminate the likelihood of being bitten, and will do much to alleviate the anxiety that often mars a trip afield.

High-topped shoes or boots should always be worn when hiking in snake country. To avoid bites above the shoe tops be particularly careful in

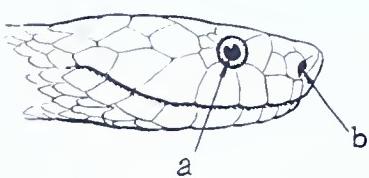
stepping down over logs or ledges of rocks where a snake could lie concealed some distance above the ground. When climbing be cautious about reaching for a handhold into nooks and crannies above your line of vision.



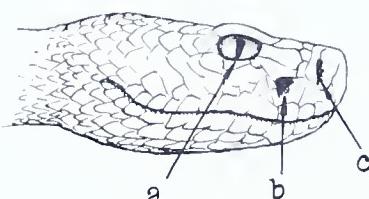
Underside of tail of poisonous snake showing un-divided sub-caudals.



Underside of tail of non-poisonous snake showing sub-caudals divided into two rows.



Head of non-poisonous snake showing round pupil (a), nostril (b).



Head of poisonous pit viper showing elliptical pupil (a), pit (b), and nostril (c).

As there is always a possibility of being bitten when far from help a good snake bite kit of the suction type is a great comfort, and might conceivably mean the difference between life and death. However, a snake bite outfit is worthless if you don't have it with you or you do not know how to use it. Make it a standard item of equipment on all your strolls into snake territory, read the instructions and *memorize* the proper method of treatment. Don't wait until you are bitten to learn the technique.

Besides the actual treatment you can help yourself by observing a few simple common-sense rules. The seriousness of a snake bite is generally

proportionate to the amount of venom absorbed by the circulatory system, therefore the flow of poison-laden blood through the body should be retarded and suction applied as quickly as possible. Acceleration of circulation must be avoided, so refrain from all unnecessary exertion, remain as quiet as possible, and do not partake of stimulants of any kind.

Most of the snakes you meet will probably be of the harmless variety. A few of these bite viciously, but with little effect, when handled, and most of them are easily tamed and can hardly be induced to bite.

All poisonous snakes in Pennsylvania belong to the pit viper family, so called from the opening in the side of the head between the eye and the nostril. No non-venomous snakes have this opening. Furthermore, the sub-caudals (the plates on the under-side of the tail back of the vent) are divided on our non-poisonous snakes and in a single row on the poisonous ones, except for the extreme terminal portion of the copperhead's tail. The pupil of the eye is another identifying feature. Pit vipers have elliptical pupils while those of our harmless snakes are round.

Only the poisonous snakes have

fangs. These are elongated hollow teeth that inject the venom deep in the flesh of the victim. They are normally two in number and are located in the front of the mouth, mounted on movable bones so that they can be erected when desired. When the jaws are closed they lie folded up against the roof of the mouth.

Non-venomous snakes have no fangs, but are equipped with numerous small, needle-sharp, hooked teeth designed merely to hold their struggling prey. Harmless snakes swallow their food alive and kicking; poisonous snakes usually allow the poison to take effect before swallowing their prey, except in the case of the smaller victims.

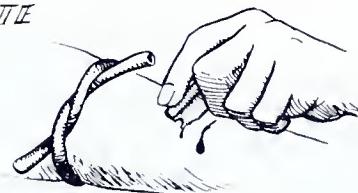
While not the best loved of our wildlife there's no denying that snakes are an interesting part of Pennsylvania's fauna. The following color photos by Hal H. Harrison, well-known wildlife photographer, and the descriptive captions written by Dr. M. Graham Netting, assistant director of Carnegie Museum, should be of considerable aid in identifying snakes in the field and in helping us to understand the habits and economic importance of our scaly neighbors.

#### FIRST AID FOR SNAKE BITE



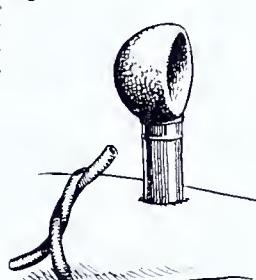
1

Apply tourniquet between fang marks and heart, then sterilize wound and cutting instrument with iodine or other antiseptic.



2

Make two crossed incisions through fang marks at least  $\frac{1}{4}$  inch deep. Only single lengthwise incisions on fingers and toes.



3

Apply suction by means of suction cup or mouth. Moisten edge of suction cup before using.

4

Draw tourniquet only tight enough to retard circulation, not halt it completely. Release tourniquet briefly every ten minutes.

SNAKES ON THIS PAGE ARE POISONOUS



**TIMBER RATTLESNAKE**—The largest and most dangerous poisonous snake in Pennsylvania, but now common only in sparsely populated mountainous areas. The characteristic black chevron-shaped blotches are superimposed on a sulphur-yellow or blackish back, colors not correlated with sex as often claimed. This snake feeds almost exclusively on warm-blooded prey, chiefly rodents and birds. Each female produces 7 to 12 young every other year, usually in September. Maximum size in Pennsylvania, about 5 feet.

(Not Shown) **EASTERN MASSASAUGA**—The "black snapper" is a small rattlesnake with large plates on top of its head, a central row of squarish blotches down the back and a small rattle. It feeds largely on small mammals and produces 5 to 9 young in late summer. Maximum length, 3½ feet, but most Pennsylvania specimens under 30 inches. This mid-western prairie snake has penetrated only into western Pennsylvania where it occurs in isolated colonies in swamps and fields in Allegheny, Butler, Lawrence, Venango, Mercer and Crawford counties.



(Left) **NORTHERN COPPERHEAD**—The copperhead can instantly be recognized by observer calm enough to remember that it is the only Pennsylvania snake with reddish triangles, with the pattern running up, along each side of the body. Although the common poisonous snake in the State, it is retiring and nocturnal and causes few accidents. Mammals, frogs, insects and birds are its chief foods. Pennsylvania females bear 4 to 9 young from late August to mid-September. Maximum size in Pennsylvania, about 42 inches, average size locally, about 30 inches. Largely absent from the glaciated northwest sections.



**NORTHERN BANDED WATER SNAKE**—This blotched water snake, usually with dark half-moons on the belly scales, is non-poisonous but ill-smelling and bad-tempered. Farmers often call it the "water moccasin," leading bookish city slickers to confuse it with the poisonous cottonmouth of the South. It is unwisely persecuted by fishermen unaware that it feeds primarily on frogs, non-game fish, and dead or diseased fish and that its numerous young (up to 44 in a litter) are relished by bass. Maximum length, 51 inches.

(Not Shown) **QUEEN WATER SNAKE**—Plain brown above except for a yellowish stripe low on each side; 2 brown stripes on the under surface; rarely bites when handled; not detrimental to fish as it feeds almost exclusively on crayfish. Litters of 10 or fewer 8- to 9-inch young are born in August or September. Maximum length, 33 inches. Absent in the higher portions of the State.

**(right) UPLAND HOUSE SNAKE**—Waxy smooth, patterned with reddish saddles and a black and white checkerboard beneath, the rat- and snake-eating house snake is one of our most benevolent serpents. Unfortunately, regularly mistaken for poisonous copperhead and, or falsely accused of killing cows and killed. Up to dozen eggs laid in June July hatch several months later. The brightly patterned hatchlings, too small to man a large grasshopper, are responsible for most September "copperhead scares" in urban neighborhoods. Maximum size, 3½ feet.





(Left) PILOT BLACKSNAKE—This powerful constrictor, largest Pennsylvania snake, also called mountain black snake, lazy blacksnake, black rat snake. The latter is preferable to the usual moniker because it is not pilot rattlesnakes which it does feed so heavily upon. Rodents that each specimen is worth at least five dollars to an orchardist or dairyman are a detriment around henhouse. Young pilots are blotched; adults may retain traces of the youthful pattern in faint crossbands of yellow or red or be uniformly shiny black. Maximum length 8 feet 5 inches but few specimens now rare.

(Not Shown) BLACK RACER—Although it resembles the pilot blacksnake the adult racer has smooth, satiny scales and no hint of a pattern on its body. In spite of its misleading technical name (*Coluber constrictor constrictor*) it does not constrict the mice, frogs, snakes, insects and birds upon which it feeds. It usually escapes rapidly through bushes or on the ground but will fight viciously if cornered. If a courting racer is interrupted it may make a short charge but will not chase the intruder any great distance. One to two dozen eggs, laid in early summer, produce 8 to 12 hatchlings about August. The largest specimen ever recorded, 5 feet 11 inches in length, was caught in Wilkinsburg, many years ago.

(Below) EASTERN SMOOTH GREEN SNAKE—This smooth-scaled bright green snake is so protectively colored for life in grass that it often escapes observation. It is extremely gentle but a finicky eater in captivity. Crickets, grasshoppers and other insects are its chief foods. From 3 to 11 eggs, laid in July or August, hatch within a month. Maximum length, 24 inches.





(Above) NORTHERN HOG-NOSED SNAKE—The characteristic hissing, neck-spreading and closed-mouth striking of this variably colored snake account for the names "spread-head," "blowing viper," "puff adder" and for the erroneous notion that it is poisonous. Its upturned snout, which makes identification easy, facilitates digging in sand or loose soil. It feeds principally on toads, lays eggs, and sometimes feigns death. Maximum length, 42 inches.

(Not Shown) NORTHERN RED-BELLIED SNAKE—Although extremely gentle this tiny snake can "snarl" by rolling up its lips. Some specimens belie their common name by having bellies of shining blue-black instead of some shade of red. A group of pale gray blotches encircling the neck sometimes causes this snake to be confused with the ring-necked snake. Slugs, earthworms and insect larvae are favored foods. Eight or fewer  $3\frac{1}{2}$  inch young are born in August or September. Maximum length,  $15\frac{1}{8}$  inches. Rare or absent in southeastern Pennsylvania, most plentiful in northern or mountainous sections.

(right) NORTHERN RING-ED SNAKE—This harmless, smooth-scaled, pencil-thick snake is a uniform slate gray except for the yellow-orange undersurface and neck ring. It is widely distributed in wooded areas where it eats insects, earthworms, salamanders and frogs. Females lay one to four 2-inch long eggs in rotten logs in June or July in which 5-inch babies hatch after about 2 months. Maximum length, 21 inches.





(Left) DEKAY'S BROWN SNAKE—This gentle little snake is marked with a double row of blackish spots bordering central light stripe. It can hide under such small bits of trash that it remains numerous even in Pittsburgh and Philadelphia. It eats slugs, earthworms, snails and insects. From 9 to 12 inches long, so tiny that 6 can coiled in a thimble, are born in August or September. Maximum length, 17½ inches.

(Right) EASTERN RIBBON SNAKE—This marsh-inhabiting relative of the garter snake is readily distinguished by its slenderness and by the brilliancy of its pattern; its three longitudinal yellow stripes are always distinct and in sharp contrast to the dark, almost black, back. It feeds upon salamanders, frogs, tadpoles and insects and bears 5 to 20 living young in July or August. Maximum length, 32 inches.



(Left) EASTERN GARTER SNAKE—Although its three longitudinal yellow stripes are often indistinct or obscured by a pattern of numerous dark spots, most persons recognize Pennsylvania's most common snake. It feeds principally upon earthworms and amphibians. Litters of 14 to 20 young are born in August or early September. Maximum size, 3 feet 8 inches.

...KEY...



- (●) ...County Seat.
- (Dog) ...Dog Training Preserve.
- (Bird) ...Farm-Game Project.  
(Open to hunting.)
- (Silhouette) ...Game Protector's  
Headquarters.
- (Silhouette) ...Game Propagation Area.
- (Deer) ...Deer Hunting.
- (Silhouette) ...Small Game  
Hunting.
- (Silhouette) ...Grouse,  
Pheasant,  
Rabbit &  
Squirrel.
- (Railroad tracks) ...Railroad.
- (Wavy line) ...Stream.
- (Solid black area) ...State Game Land.
- [Boxed number] ...Pennsylvania Route Number.
- [Boxed number] ...U.S. Highway Route Number.
- 66059 ...Legislative Route Number.
- ...Township Route. (T-642)

PENNSYLVANIA  
GAME COMMISSION

# YORK COUNTY

PENNSYLVANIA

Scale in miles



tended Lancaster county across the Susquehanna River, encompassing what is now known as York County. In 1749 the land west of the river was called York county, in honor of the English county, Yorkshire.

Although these settlers were not bothered by Indians until the French and Indian War, there was continual border warfare with the settlers from Maryland, since the territory west of the Susquehanna was claimed by Lord Baltimore's colony. It was not until after the Revolution that the Mason Dixon Line served to reconcile disputed claims and hard feelings in York county.

When the British occupancy of 1777 forced the Continental Congress to leave Philadelphia, York furnished them with a haven of safety.

Hanover was the scene of the first Civil War battle north of the Mason Dixon Line, when the Union Generals Custer and Kilpatrick fought a cavalry engagement through the streets of the town with General J. E. B. Stuart.

In 1863 the bridge built across the Susquehanna river, at that time the longest wooden bridge in the world, was burned by Pennsylvania soldiers in a successful attempt to halt the advance of the Confederate Army.

The first iron furnace west of the Susquehanna River, Mary Ann Furnace, was erected in the county in 1762. The ruins of Codorus Forge, erected in 1765 by James Smith, a signer of the Declaration of Independence, can still be seen. The iron industry was one of the county's most important before the Civil War, but competition from other centers caused it to begin to decline by 1860.

The location of York County on the Susquehanna made it an important crossing point and many ferries were located there. In an effort to attract trade to Baltimore, Maryland influenced the improvement of transportation by river, canal and rail. Thousands of westward moving

pioneers passed across the ferries and turnpikes of the county between 1760 and 1840.

Among the early craftsmen and artisans in the York county region were clockmakers, pewterers and gunmakers. Some of the finest Pennsylvania flintlock rifles originated in the shops of York county riflemakers.

#### Recreation—Hunting

Deer hunting in the county is spotty, but good. Excellent small game hunting may be found throughout the county; rabbits and pheasants are plentiful in the farming sections and squirrels in the woodlots, creek bottoms and mountains. Fox and raccoon hunting are popular sports.

Game Lands Number 83, near York Furnace, comprises 760.8 acres; Number 181, near Airville, comprises 563 acres.

#### Recreation—Fishing

Fishable waters (name of stream or lake, fish stocked, location and length or area of stock waters) include: Beaver Run, brook trout, Windsor, 4 mi.; Blymire Hollow Run, brook trout, Wintertown, 4 mi.; Fishing Creek, trib. Muddy Creek, brook trout, Castle Finn, 3 mi.; Fishing Creek, trib. Susquehanna River, brown trout, Windsor, 4 mi.; Furnace Run, brook trout, York Furnace, 2 mi.; Haldeman Pond, rainbow trout, Hanover, 8 A.; Leibs Creek, brook trout, Stewartstown, 3 mi.; Orson Run, brook trout, Airville, 3 mi.; Otter Creek, brown & rainbow trout, New Bridgeville, 3 mi.; Rambo Run, brook trout, Rinely, 3 mi.; Rehmayer Hollow Run, brook trout, Jacobus, 2 mi.; Toms Run, brook trout, Airville, 3 mi.; Wallace Run, brook trout, Kyleville, 4 mi.; Bermudian Creek, black bass, Wellsville, 7 mi.; Conewago Creek, black bass, Dover, 20 mi.; Little Conewago Creek, black bass, Dover, 6 mi.; Susquehanna River, black bass, Goldsboro, 11 mi.

. . . The End.

(Continued from page 30)

measure and an automatic priming device. It is plenty powerful for full length resizing and is of the turret head bench type. It has shell holders for four different size cartridge heads together with primer punches of the proper size and shape for all primers. This is a de luxe tool for the shooter who has a lot of guns and who shoots them all. Price is about \$70.00. A small, especially rugged model using a single die is called the Hollywood. It will swage bullets and do all heavy work. It is suited to quantity loading and is a good bet at \$38.00.

Potter has three models for the hand loader. The Potter Gem retails for about \$30.00. This is a good tool for full-length sizing of revolver cartridges or neck-sizing rifle cartridges. The standard Duplex at \$60.00 is an overhead bench type tool suited for most heavy work. The real headliner of the Potter line is the Automatic Duplex which sells in the neighborhood of \$70.00. It has a full automatic priming device and has a very heavy base for mounting on a bench. It is equipped with a powder measure of Potter design mounted in the head. Two types are available. In the one, the powder measure cylinders are set at the factory to throw a certain charge. Additional cylinders can be ordered to throw any charge desired. This is chiefly used in reloading revolver cartridges and does away with checking and the use of scales. There is a micrometer adjustable type for rifle cartridges—a high production tool which loads one shell complete with each operation of the lever. Dies for most standard calibers can be had.

While this is by no means a complete list of reloading tools on the market it is representative of the various types and price class that will meet the requirements of most any handloader.

(To Be Continued)

## BIRDS OF THE PYMATUNING REGION

A new 226 page book, *Birds of the Pymatuning Region*, by William C. Grimm, has recently been completed and is currently being offered for sale at one dollar per copy by the Pennsylvania Game Commission. The book is six by nine inches in size, and contains innumerable black and white illustrations as well as six full page color plates of forty species of birds. A full color cover depicts a wood duck drake, one of the most common summer resident waterfowl of the region.

The text not only contains records and interesting notes on all birds reported in the Pymatuning Region, but also describes the flora, fauna and topography of this interesting western Pennsylvania area. Because of the varied topography the birdlife of this region embraces practically all species found anywhere in the state. Waterfowl, shore birds, marsh birds, upland game birds, song and insectivorous birds, birds of prey—all are included in the text of this single work.

*Birds of the Pymatuning Region* can be obtained at the Pymatuning Museum or by writing to the Pennsylvania Game Commission.

The Alaskan moose, found in the Kenai Peninsula, carry the largest antlers in the deer family, sometimes spreading to a width of seventy inches.

\* \* \*

The cheerful songs of tree frogs are heard most often during damp weather and before a storm. Thus they have been given an undeserved reputation as weather prophets, but really it is only because they are stirred to life by unusual moisture in the air.

\* \* \*

# Dandy Dogs

By Rutherford Montgomery



Photo By Maslowski & Goodpaster

*Despite his small size the little-known least weasel is an efficient rodent and insect destroyer. From tip to tip the "pygmy weasel" measures a bit more than seven inches.*

THERE was for many years, and may still linger, a superstition in the West of England to the effect that hares are hunted on moonlit nights by packs of little fairy hounds, known as "Dandy Dogs." This superstition might well have originated right here in our own forests because fairy hounds do hunt in packs at night, the superstition is based upon fact. The Dandy Dogs have been seen though no one has ever made any close observations of them, the fairy hounds being elusive and the chosen hour of the hunt is always a time when there is little light, but much deep shadow.

A very interesting bit of history comes to light in connection with

these hunters. "Vair" is old French for fur, usually Ermine or Weasel. "Vairy" comes from this word and was changed by the English to "fairy," a name which persisted a long time as the name for the little English weasel. It has been suggested that Cinderella wore slippers of *vaire* not glass which is *verre*. In this case the truth seems more romantic than the accepted version, ermine slippers would be nicer for a girl who was to marry a king.

It has always been accepted as a fact that the weasel, be he the Bridled, New York, Bonaparte, Long Tail or Richardson's, is a destructive, blood-thirsty fellow who kills for the lust of blood and as such should be

destroyed ruthlessly. Any farmer who has discovered a whole flock of hens dead and uneaten, will heartily agree. But there is a weasel which should be welcomed by the farmer. He is a small cousin of the Dandy Dogs of England, the Least or Pygmy weasel.

It would require all of the powers of a fairy godmother to catch enough of these tiny hunters to make a pair of slippers even for a Cinderella, because they are not only elusive, they are small, no larger than a big wood-mouse, chest measurement one and a half inches, depth through the thickest part of the body three quarters of an inch at most. That was the report made on a Pennsylvania Pygmy Weasel. They appeared to have been designed by nature to slip into a mouse hole, which they easily do, mice being their favorite diet with insects filling in when the mouse population gets low.

Getting back to the fairy hounds seen by moonlight. We are better able to understand why the country folks of West England were so sure they saw such hunters when we examine the habits of our own little weasels. None of the weasel family, and that goes for the, Pygmy, are sociable enough after they grow up to hunt in packs. They are all surly and savage creatures that fight savagely even when they mate. But like all wild mothers mother weasel loves and protects and trains her young. So on a moonlit night in late summer or early fall it is possible to catch a fleeting glimpse of a family out hunting with the mother leading five or six savage and blood-thirsty children to the kill. In the case of our pygmy the game would be a field-mouse or a wood-mouse, in the case of the English cousin, which is bigger the game might be a rabbit.

The known biography of this little killer would make a slim volume indeed, for few have observed it and not many specimens have been taken. Trappers who have taken hundreds

of weasels may never had found a pygmy weasel in a trap or seen one alive. Quite a few of the specimens caught were taken in an ordinary mouse trap, caught while stalking the mouse.

This hunter is the smallest of all flesh eating animals, the littlest carnivore, the least weasel. In summer its coat is umber brown above and pure white without yellow tinge underneath. There is no black tip on the tail. In winter the coat is pure white. Like all weasels the pygmy is nervous and seems angry most of the time. It can be do the same vanishing act as a big weasel, but because it is so small the act seems more perfect. It is fearless, but it is also cunning and wary. If it hears you approach it it apt to vanish as though by magic, even on open, wind-swept ground where its white coat would seem to place it at a disadvantage.

Out in the woods you will be more likely to hear the least weasel than to see it. Its chirrup, chirrup may be heard from a thicket but you are not likely to catch a glimpse of the hunter, though he may walk out into the open and look you over with defiant curiosity. You may think you have seen a baby weasel, though a close look will tell you different.

I have seen and trapped many weasels but the only Pygmy I ever saw was on a fishing trip in Colorado on the Western Slope of the Rocky Mountains above Gunnison. I had been fishing in Mill Creek and had caught a nice mess of brook trout. Before starting down the trail I sat down on a rock and dropped my creel. I was roused from my contemplation of the far slope by a flash of movement in the grass near the fish creel. A moment later a small animal popped out of the grass and started trying impudently to get into the basket.

At first I thought it was large field mouse but after a second look I decided it was a baby weasel, one

more enterprising and further advanced than most little weasels of its size. When he did not run away I waved my rod at him. He just sat up and hissed at me. He wasn't over five inches in length but he had all of the angry impatience of any weasel I had ever met. Thinking to have a bit of fun with him I took a small fish from my basket while he danced about making passes at me and then at the basket. The fish was perhaps eight inches long. I sunk the fly hook into the tough, projecting upper lip of the trout and dangled the fish above the little hunter. The weasel danced and leaped and ducked as he tried to get hold of the fish. Suddenly he sprang high into the air, sunk his teeth into the back of the trout and jerked it from the hook. Off he darted into a thicket dragging a fish bigger than himself.

I did not realize for some time that I had just met the smallest of the carnivore. But as I recalled the markings and the build of the little weasel I began to wonder and later started digging for information. I found a few scattered accounts and a number of excellent descriptions. The Pygmy Weasel was a breed apart from the other weasels though a member of the family. It was found from the Arctic as far south as winter snow conditions fitted its way of life.

Why the tribe has not increased I do not know. Certainly few are caught. It does not seem likely that the hawk or the owl would catch many of them, though the owl does manage to kill a few weasels, sometimes to the sorrow of the tiger of the air, as the records show. One dead owl and one dead weasel with its fangs sunk into the neck of the owl, mingled fur and feathers decomposing on a sunny slope. Perhaps it is due to the savage nature of this tiny hunter. His way of life is the way of one who goes out of his way to seek trouble, and his home life is as savage as his hunting.

It is possible that many hunters have seen the lesser one and thought him just a little weasel not yet full grown. But it seems hardly necessary to urge hunters not to shoot him, because very few will get as good a look at the small one as I did. But any who recognize him should greet him as one who does considerable good in his tough and cocky way.

. . . *The End*

While most birds are able to move only one, both mandibles of the parrot's beak are movable and are endowed with considerable muscular power.

\* \* \*

When carrion attracts king vultures and common vultures, the common vultures stand back while the king vultures eat their fill.

\* \* \*

The young of the Opossum weigh only about 4 grains two weeks after birth, yet are quite active.

\* \* \*

The common shrew will starve to death in two or three hours unless food is obtainable. It will eat twice its own weight of food each day.

\* \* \*

Whales can dive to enormous depths. There is a record instance of a sperm whale becoming entangled in a submarine cable 3,200 feet down.

\* \* \*

The largest frog is the Goliath frog of West Africa. Its large thigh bones are highly prized by the natives for use in ceremonial rites.

\* \* \*

The bald eagle was adopted as our national emblem by the Congress on June 20, 1782.

\* \* \*

The hippopotamus differs from the rhinoceros in having four instead of three toes.



By Ed Shearer

## Long Range Hunting Rifles

HAVING discussed deer rifles and brush rifles in recent columns some of the hunters I met this past season have said, "Why not give us your ideas on long range rifles." I have consistently side-stepped that one ever since I started writing this column, for several reasons.

In the first place while in the forestry service I spent two bad winters practically living with the deer, feeding them and studying them. I had a number of examples of bad and promiscuous shooting on my hands. The helplessness in the eyes of these cripples as they watched you, too deep in their suffering under intolerable conditions to run away—it's not a pretty sight. I love wildlife too deeply to ever acquire the nonchalance of a butcher.

I firmly believe that no man (or woman either) has a moral right to use a weapon on our wildlife until he has acquired sufficient skill to insure clean kills under average conditions at the range at which he takes his shots. Every hunters prayer should be, "Oh God, let me kill cleanly or miss completely."

In the second place long range shooting does not lie within the skill of the average hunter, or above average, for that matter. This is a field for experts only—those hunters who have spent years studying their rifles' performance at long range. Usually they are the product of a military range or live in a location that affords plenty of long range practice. For instance, from my yard I can shoot at various game-sized targets at all

ranges up to 600 yards. A hunter of this class will fire more ammunition in one year than the average hunter will in a lifetime; he is a perfect combination of range and woods experience.

There is one thing we should get clear before some wild-eyed brother starts braggin' about killing 'em day before tomorrow with the "thutty-thutty." Just what is long range? In woods parlances I would say that long range begins where a long woods shot leaves off and still quite short of what a military shooter calls long range. A poll of opinion among experienced deer hunters of my acquaintance agreed that 200 to 250 yards "were a right fur piece in the woods." So to establish long range in the game fields let us take from 250 yards to an extreme of 500 yards. This latter is what a military shooter would call midrange.

There is no shadow of doubt that plenty of game is being taken within these ranges in the West while today game within these ranges seems to be the rule rather than the exception in Africa. Now during my years at Camp Perry and looking over the scores of recent national matches, I've not seen anything that leads me to believe that the West has a monopoly on capable long range shots.

Whenever any of our top flight hunters or shooters went to Africa they left a shooting record that was long remembered—notably Stewart Edward White, Don Hopkins and many others not so well known. I grew up in the same town as Don and

have shot with him enough on the range to know that he was a fine shot before he moved west.

The average hunter may well ask, "How do you judge a capable long range shot and how does he get that way?" That takes some answering, but for a start I'd say a man who can put ten consecutive shots in the bull at 600 yards in the military target should hit a deer at 400 yards with proper equipment if he evaluated the conditions just right. The woodchuck hunter should be able to take a deer around 100 or 150 yards farther than he takes his chucks and with about the same degree of certainty. I know several shooters this would put in the 400 yard class. The stumbling block for us all is the difficulty of estimating range under varying conditions.

The vital shoulder area of our Pennsylvania deer runs about 10 inches square in our larger deer and about 8 inches in our smaller deer. Thus, a hunter is effective only at the range at which he can keep his shots in an 8 to 10 inch group, which is 2 minutes of angle at 500 yards. It can be readily seen that most of our deer rifles can do the job at 200 yards but from there on out the going rapidly gets tougher and something better is needed.

The first thing the average hunter will note is that long range rifles are somewhat heavier than woods rifles. They will run from about nine pounds with scope and sling to as heavy as the individual can lug and still have strength to crawl back to camp at night. It can be stated here that this type of hunter is usually a watcher from the high places and not a brush buster, so he can pack a heavier gun without undue fatigue.

Accuracy should not exceed  $1\frac{1}{2}$  minutes of angle at all ranges which means  $1\frac{1}{2}$  inch groups at 100 yards and  $7\frac{1}{2}$  inch groups at 500 yards. The smaller the group the more leeway you have on errors. To remain in my gun rack a rifle of that type must do

a minute of angle or an inch per 100 yards at all ranges. That means a bolt action, for no other type repeating action could take the pressures necessary to get the trajectory and accuracy at long range. Also, in this type of shooting you have time to get set, which means shooting from a prone or sitting position or a rest with a tight gun sling. Any rifle with a two-piece stock will throw its shots high or low as sling tension varies.

Speed of fire is a secondary consideration in this method of hunting. It is the aimed shot that counts. The more time and care in getting away the shot the better your chance of eating steaks.

The barrel should be of good weight although weight should not be overdone. A straight taper barrel of medium weight from 24 to 26 inches will be the stiffest and have the least vibrations for its weight of any type. I have been shooting such a barrel all summer and it shoots within one minute of angle right out to the limit of its working range. Furthermore in two months of shooting it held the same point of impact and put the first shot out of a clean cold barrel right in the normal group. Such a barrel is to be treasured. Believe it or not, it was a standard model bought across the counter. Walking and tooth pick barrels have no place in this game.

Here is where the target type stocks seen on most bolt action sporters come into their own. They should be longer than the brush rifle stock with high combs that support the cheek and center the eye in the scope. Drop at the heel should be slight. It only takes one belt on the beezer to convince one of the folly of a short stock on a gun that is to be shot in the prone or sitting position. A scope is a virtual necessity. Anything else is out of place on a precision long range rifle. It should be 4 to 6 power (one of the new variable scopes is a good compromise) and should have a me-

dium fine cross hair reticule. The cross hairs generally supplied cover too much of the game for fine holding at 200 yards and over.

The trigger pull must be light and break clean. Even a double set trigger is fine on this type rifle. You must be able to get the shot away when the cross hairs are just right. A good 7/8 or 1 inch sling completes the deal.

Present-day factory rifles and cartridges that can make the grade are limited to four calibres and two makes or rifles in the domestic field. They are the .257 Roberts, the .270 Winchester, .30-06 Springfield and the .300 Magnum, in rifles made by Winchester and Remington. With the exception of the Magnum I have shot them all this past summer and have a lot of data to go on.

With the possible exception of the .270 with the 130 grain factory load we might have to go to custom loads to get the desired results at long range. Factory ammunition failed to give me better than 2 minutes of angle, even in the model 70 Winchester.

But with handloads using 4350 powder and selected bullets it was a different story. Not only was velocity materially increased but accuracy ran consistently 1½ minutes of angle or better, under good conditions. The .257 especially gets a good lift out of 4350 powder. With a maximum charge behind a 100 grain Sierra bullet it breathes right down the neck of the .270 at all ranges out to 500 yards and has given me better accuracy. My own and other reliable firing data shows groups of 4 inches at 400 and 5¼ inch at 500 yards with this load. The 117 grain can be boosted to 2900 ft. velocity. These loads are the reason the .257 Roberts is on this list. Improvement in the .270 seems to lie in the choice of bullets, as this cartridge is already loaded to nearly the safe maximum. Any attempt to build up velocity by increasing the powder charge seems to build up pressure

faster than velocity. The 130 grain bullet at 3140 appears to be the best bet.

The .30-06 is a problem, as there are all kinds floating around and some of them are definitely not safe with maximum loads. However, in a good rifle such as the model 70 Winchester the 180 grain bullet can be driven at 2850 ft. velocity with 1½ minute of angle accuracy. The 172 grain bullet which can be shoved along at better than 2900 ft. per sec. is probably superior, as it will expand more reliably at long range.

The .300 Magnum is the king of them all, commercially. With a belly full of 4350 powder it will chase a 180 grain bullet over the scenery at 3100 ft. per second, than which there is no whicher. The one flaw is recoil. Take your 12 gauge shotgun and a trap load. Sit down and coolly squeeze it off at a knot hole in a board. If you enjoy it you will like the Magnum.

Bullets are the problem. If they open up at the longer ranges they will probably blow up at the shorter. If they don't blow up at the shorter they won't open up at long range. On deer a blowup doesn't matter unless it is a raking shot when an occasional failure will pop up. With the exception of the Magnum it's doubtful whether any of them will open up from 400 yards on unless they hit bone, but they all have sufficient penetration on side or quartering shots.

One thing is certain—the bullet must be right for the calibre, with proper sectional density and good shape, to get results at long range.

Now that we have covered the equipment of a long range shot the only thing that is left is to correctly estimate the range, the wind velocity, the right amount of lead if the game is moving, try to get the normal sling tension and get the shot away when the cross hairs are just right to correct the foregoing conditions. Your equipment is equal to it. Are you?

... *The End.*



# CONSERVATION NEWS

## WARREN COUNTY NAMED "COUNTY OF THE YEAR"

During the March convention of the Pennsylvania Federation of Sportsmen's Clubs held in Harrisburg, Warren County was named the outstanding Pennsylvania county in conservation activity for 1951, winning the first leg of a handsome trophy. President S. Dale Furst made the presentation to Don Curtis, delegate from Warren County.

Five counties were entered in the contest; Cameron, Fayette, Lehigh, Montgomery and Warren. Judges were: Charles K. Fox, vice-president of the Pennsylvania Outdoor Writers Association; Johnny Mock, editor of ALL OUTDOORS, for the Pittsburgh Press; and Dr. Francis J. Trembley, head of the biology department of Lehigh University.

Among the many commendable conservation practices undertaken by the sportsmen of Warren County

*Federation President S. Dale Furst (right) extends congratulations to Warren County delegate Don Curtis for their winning conservation program.*

PGC Photo



were the establishment of a public fishing project, restoration of a dam and recreational development of the adjacent territory, building of eight pheasant rearing pens and the release of 2300 birds, distribution of packets containing seeds of shrubs and trees of value to wildlife, free distribution of multiflora rose seedlings to farmers, pruning of wild trees and carrying out release cutting program, augmenting State Game Commission bounty with a four and two dollar bounty on great horned owl adults and fledglings, financing of a mail-cancelling die for use in the Warren post office carrying a fire-prevention message and innumerable other worthwhile projects.

### Highlights of the North American Wildlife Conference

Approximately one thousand conservationists, fish and game administrators, biologists, and sportsmen attended the 17th North American Wildlife Conference in Miami, which was held on March 17 through 19, according to the Wildlife Management Institute. Represented in the registered attendance were people from nearly all of the states and the provinces of Canada, Alaska, Mexico, and the Virgin Islands.

One of the highlights of the Conference was the presentation of a national natural resources policy at a general session presided over by the Honorable James H. Duff, U. S. Senator from Pennsylvania, who was assisted by the Honorable Clark W. Thompson, U. S. Representative from Texas. The sweeping policy, which covers the management and restoration of all renewable natural resources, including soils, waters, forests, and wildlife, was presented by William Voigt, Jr., chairman of the Natural Resources Council of America and executive director of the Izaak Walton League of America.

The policy was formulated by a committee consisting of the executive heads of the major national conservation organizations and has been endorsed in principle by most of the membership organizations in the field.

After the formal presentation of the policy statement by Mr. Voigt, the need for such a policy was discussed by a panel of four experts consisting of the Honorable Clifford R. Hope, U. S. Representative from Kansas; Newton B. Drury, chief of the division of beaches and parks, California Department of Natural Resources and former director of the National Park Service; Lloyd E. Partain, manager of the commercial research division of the Curtis Publishing Company; and Robert C. Cook, managing editor of the *Journal of Heredity* and author of *Human Fertility*.

The opening general session, devoted to shortcomings in the conservation program was a source of much interest to those attending the Conference. Cleveland Van Dresser, West Palm Beach radio commentator and author struck out heavily at laxity in the antiquated mining laws, which, he reports, are robbing the American public of alarming segments of their public lands. Mr. Van Dresser recently returned from a survey trip of the western national forests and public domain. The need for zoning the wilderness areas was discussed by Dr. W. J. K. Harkness, chief of the division of fish and wildlife in the Ontario Department of Lands and Forests.

The important role of insects and diseases in limiting forest production in the United States was reported by Lyle F. Watts, chief of the U. S. Forest Service. Mr. Watts pointed out that these two agents overshadow fire in their destruction of timber and watershed values. The development of chemical weed-

killers and insecticides and their effect on wildlife was reported by Dr. David G. Hall, chief of the division of information of the Bureau of Entomology and Plant Quarantine. Contributions to pollution control by the states were reported by David B. Lee, bureau of Sanitary Engineering of the Florida State Board of Health.

The final general session was devoted to a panel discussion of current waterfowl problems. Participating were George B. Saunders, flyway biologist of the U. S. Fish and Wildlife Service; Harrison F. Lewis, chief of the Canadian Wildlife Service; C. Gordon Fredine, in charge of drainage studies, U. S. Fish and Wildlife Service; Lloyd Scouler, California State Migratory Bird Committee; Elmer Peterson, director of the South Dakota Department of Game, Fish and Parks; and B. W. Cartwright, chief naturalist of Ducks Unlimited (Canada).

Throughout the Conference technical sessions devoted to all phases of natural resource management were conducted.

### Refuge Streams Opened To Fishermen

Pennsylvania fishermen are very happy that many miles of trout streams formerly closed to them have been opened to angling this year.

The game law says it is unlawful for any person to fish in waters within the boundaries of any state game refuge, or to take fish from them, except such streams as the Game Commission may declare open to lawful fishing in accordance with the fish laws of the Commonwealth, or under such provisions or regulations as may be agreed upon between the Game Commission and the Fish Commission.

At their January meeting, the Game Commission approved the request of Charles A. French, Execu-

tive Director of the Fish Commission, not to close fishing on streams within state game refuges. This applies only to state game refuge streams that have been stocked with trout by the Fish Commission.

Signs posted conspicuously along such streams will notify the public that the waters are open to lawful fishing from April 15 to July 31.

Unposted streams in state game refuges will remain closed to fishing.

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### NEW KENSINGTON TRAPPER RECEIVES AWARD

John Patla, New Kensington miner and part-time trapper, was recently presented with a \$200 award in connection with Sears, Roebuck & Company's Twenty-third National Fur Show. The result of twenty-five years' experience in trapping fur-bearers, Patla's pelts were selected as among the top ten received in a tri-state area during that week. The pelts were judged for proper handling and preparation in a contest designed to eliminate the appalling annual loss to the nation's trappers and fur industry through improper pelt handling.

The award was made at a Pittsburgh gathering attended by representatives of Sears, Roebuck and Company, the Pittsburgh and New Kensington Chambers of Commerce, the Pennsylvania Game Commission and district outdoor writers.

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Opossums are rather slow-moving, stupid animals which seek safety by their retiring nocturnal habits and non-resistance to enemies. It is because of this last trait that the familiar "playing possum" originated.

\* \* \*

The white Bishareen camel is the most valuable of the tribe, being very fast and capable of outrunning a horse. They make excellent mounts.

## NEW YORK REPORTS ON HUNTING ACCIDENTS

New York State had 141 hunting accidents involving firearms in 1951, Conservation Commissioner Perry B. Duryea revealed today. Of that number, he said, 17 accidents were fatal, four more than in the previous year but one less than in 1949 despite approximately 100,000 more hunters afield. Six of the 17 fatal injuries and 37 out of the 141 non-fatal were self-inflicted.

Of the total accidents, only 17 involved deer hunters among the more than 400,000 persons who obtained licenses to take deer. Six were fatal, the same number as in 1950.

Again, accidental discharge of firearms from carelessness led the accident list with 74 injuries. Of the remaining 68 mishaps, 49 hunters were wounded by others firing at game while 13 hunters admitted they actually mistook their victims for game of one kind or another.

Major cause of injuries through carelessness was the fact that hunters failed to use the safety devices with which their guns were equipped. If these devices had been in use at least 60 of the 74 accidental discharges never would have occurred, Commissioner Duryea pointed out. Thirty guns alone were discharged when their users fell, crossed fences or when brush tripped the triggers. Two of them were discharged while carried loaded, illegally, in cars.

Rabbit hunters were the most shot—43 of them, one less than in 1949, despite the fact that many thousands more hunters spent untold more man-hours after cottontails last fall because of generally more abundant supplies. Woodchuck hunters numbered only two less victims than deer hunters while partridge hunting drew 12 casualties, squirrels 9, pheasants 7 and foxes 5. The remainder were about equally divided

between ducks, crows and a scattering of a half-dozen other species.

Shotguns caused 94 mishaps, rifles 45 and two were unknown.

## Hunting Licenses Cost U. S. Hunters 38 Million Dollars

The sale of 12,660,993 hunting licenses during the fiscal year ending June 30, 1951, brought the 48 states an all-time high gross revenue from this source of \$37,840,791. The 1950-1951 gross revenue exceeded by \$199,742 the 1945-50 total, while the 1950-51 total of licenses issued was 23,192 greater than the previous year's total of 12,637,801. Nonresident licenses accounted for 15,598 of this increase.

Pennsylvania again ranked first among the states in gross revenue from license sales and second in the number of licenses sold.

For comparative purposes, the "big ten" in the license sales line-up are shown for the 1950-51 and 1949-50 hunting seasons. Michigan, Pennsylvania, New York, Ohio, Illinois and California—in that order—still head the list.

### 1950-51

Michigan	.....	\$1,037,633
Pennsylvania	.....	827,949
New York	.....	805,608
Ohio	.....	708,048
Illinois	.....	496,749
California	.....	493,247
Wisconsin	.....	483,097
Indiana	.....	432,319
Washington	.....	413,385
Tennessee	.....	358,639

### 1949-50

Michigan	.....	\$1,031,035
Pennsylvania	.....	834,091
New York	.....	751,036
Ohio	.....	740,509
Illinois	.....	503,420
California	.....	497,212
Minnesota	.....	479,746
Wisconsin	.....	460,408
Washington	.....	418,726
Indiana	.....	392,821

In "hunting fees paid," the first ten States are listed below:

**1950-51**

Pennsylvania	\$3,046,156
Michigan	2,980,350
Washington	2,243,616
Colorado	2,185,452
New York	2,179,792
California	1,928,863
Oregon	1,492,936
Missouri	1,135,939
Illinois	1,053,441
Wisconsin	1,016,307

**1949-50**

Pennsylvania	\$3,032,326
Michigan	2,944,885
Washington	2,228,907
Colorado	2,049,065
New York	2,043,004
California	1,946,867
Oregon	1,288,699
Minnesota	1,238,043
Wisconsin	1,178,763
Missouri	1,099,565

## SHE BEAR AND CUBS MOLESTED

In the opinion of Claude B. Kelsey, a Clearfield County game protector, some humans will go to almost any end to satisfy their curiosity, even at risk of personal injury.

"During February," he reports, "we had no end of trouble trying to protect a pair of bear cubs. Two

cubs were born to a mother bear early in February in the Winterburn Sabula Mountains. When it became generally known that the bears were in the vicinity the reaction was about the most inhumane I have witnessed. Many persons went to the den out of sheer curiosity; others appeared on the scene bent on molesting and worrying the mother bear. They punched her with poles and threw stones, sticks and flashbulbs into the den. Dogs were taken there to get the reaction of the old bear.

"I have had considerable experience with bears," said Kelsey, "but this mother had more forbearance than any bear I have ever observed."

The den was made a propagation area, but Kelsey says someone with authority must stand guard there anyway because some persons would go inside the wired-off area; even against law, to molest the little family.

Photo by Philip Da More

*Victims of inhuman treatment this little family was driven out of their den by curious onlookers.*





## **WOMELSDORF HIGH SCHOOL CLUB HAS DIVERSIFIED PROGRAM**

In a recent letter Elwood E. Himmelberger, advisor to the Womelsdorf High School Junior Sportsman's Club, reports an intensely interesting and widely diversified program undertaken by the youthful members. He reports, in part:

"The club is one of the few in Berks County that has an active program of rabbit trapping, bird house building, fox trapping, instructions in firearm handling, a safety program, fly tying, motion pictures concerning wildlife, etc., field trips, and many other activities too numerous to mention.

"During the first year the club was organized they participated in the Pennsylvania Game Commission's rabbit trapping program, which they are also doing this year. Citizens of the borough were asked to communicate with the club advisor to request the services of club trappers in the event of garden damage by rabbits. The local rod and gun club participated in the program by giving each boy seventy-five cents for each rabbit trapped. At the time of this writing the total number of rabbits caught numbers 60. One member enticed 17 bunnies into his traps. Local sportsmen report the boys' efforts in this project has resulted in a larger bag of game in the vicinity of the town.

"Our local game protector, Elmer Turner, Centerport, has been very helpful to the club. So far he has supplied us with rabbit traps, taught the boys to operate them, gave talks

on fox trapping, and started some of the boys on traplines of their own.

"Another source of information for our club has been the school custodian, Mr. Howard Batdorf. In addition to his duties at the school Mr. Batdorf is also a raw fur dealer. He attends every meeting of the club and has given many talks on trapping and fishing. He is very adept with the fly rod and has given instruction in its use—out of doors when weather permitted, and in the gymnasium during bad weather.

"The boys are also fortunate in having George Bashore, deputy game warden and angler extraordinary, visit the school frequently and show the boys how to tie flies. Mr. Bashore has also encouraged the boys to provide food for game animals during the winter months. One day some twenty pheasants were observed eating corn put out by club members for that purpose.

"During January the boys began a bird house building program, constructing their houses in accordance with the plans contained in the Game Commissions publications *Attracting Birds* and *Pennsylvania Birdlife*.

"Just before the opening of the hunting season the club observed Governor Fine's "Hunt Safely Week" by giving an assembly program on safety. While entering the auditorium the boys and girls were given the pamphlet *Ten Commandments of Safety* and during the program club members demonstrated the right and wrong way to handle firearms and the improvement of farmer-sportsman relations. Private property and safety zone signs were displayed and their meanings explained to the



*Rabbit trapping champion of the club, Karl Fink, poses with one of fifteen rabbits he live-trapped for release last winter.*

Sportsmen would do well to note the invaluable part played by interested, public-spirited individuals in offering their services to Junior Sportsmen's Clubs. With support of this kind, clubs cannot fail to respond with enthusiasm and worthwhile accomplishments.

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Some birds cannot walk, while others walk with difficulty. Swifts, for example, never walk and never set foot on the ground, the Fish and Wildlife Service says. Nighthawks, whippoorwills, and other goatsuckers walk clumsily, having weak legs.

\* \* \*

Bow and arrow hunters in the United States bag more than a thousand deer, a dozen bear, a few elk, and some puma, javelina and wild boar every year, the Fish and Wildlife Service reports.

\* \* \*

Skunks are often justly accused of raiding duck nests and of killing ducklings, but skunks also eat quantities of snapping turtle eggs—and snapping turtles kill large numbers of ducklings, the Fish and Wildlife Service points out.

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#### NOTICE OF COMMISSION RESOLUTION

WHEREAS, pursuant to the provisions of Act No. 564, approved January 14, 1952, the Department of Agriculture has given notice to the Pennsylvania Game Commission that the County of Chester is infested with rabies; therefore

RESOLVED, that under the authority of Articles I and V of the Game Law, as amended, protection is hereby removed from raccoons, on the list of game animals, in the County of Chester, as required by said Act, until further notice.

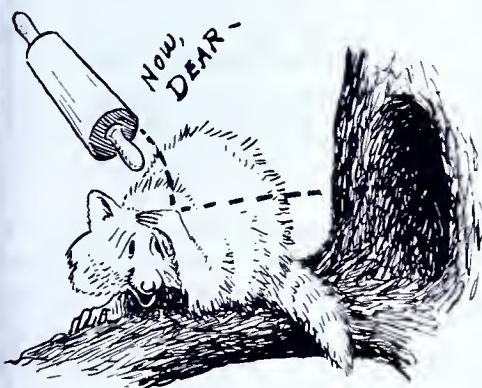
RESOLVED, that notice of the foregoing action shall be duly published in each County affected, in accordance with the provisions of Section 505 of Article V, of the Game Law, and that the Executive Director is hereby authorized and directed to certify the foregoing as a rule and regulation of the Commission.

Thos. D. Frye  
Executive Director  
Pennsylvania Game Commission



### White 'Coon

PORT ROYAL, Juniata Co.—Food and Cover Foreman L. Kline, who resides at S.G.L. No. 215, caught a white raccoon in a predator trap near our ringneck holding pen and turned it over to me. "Whitey" now has a good home in the Hershey Zoo. He was all white except for an off-color on his front shoulder and a light creamy ringed tail. Whitey must have stayed out with the boys too late one night, as half of one ear had been chewed off. District Game Protector Owen E. Seelye, Port Royal.



### Hawk Plays Rough

BLAIN, Perry Co.—Recently a sharp-shinned hawk caught a blue-jay in a pine tree in the lawn at my headquarters; and after the jay did quite a lot of growling, which attracted my cocker spaniel dog to the scene, the hawk released the jay and took off for parts unknown. District Game Protector Harold E. Russell, Blain.

### More Elk Reported

WILLIAMSPORT, Lycoming Co.—I have had more reports of hunters that have seen elk or elk signs on

McIntyre Mt. One hunter had the bull elk in sight of him for about 10 minutes and he was sure it was an elk and saw tracks of two other elk. One farmer saw one elk near his farm about a year ago. District Game Protector Levi Whippo, Williamsport.

### Water Turkey ??

WILLIAMSPORT, Lycoming Co.—On February 23, 1952, I received a phone call from one of the beaver trappers in my district. When he went to check his traps in the morning he noticed that one trap was sprung and the drowning stone was pulled out into deep water. He started to fish his trap out, feeling sure he had a beaver. When he got what was supposed to be a beaver into shore it turned out to be a wild turkey. Apparently, the turkey was along shore for water and grit when it got caught. District Game Protector Paul Ranck, Williamsport.

### Feed Makes the Difference

LIGONIER, Westmoreland Co.—It is hardly believable that there can be so much difference in deer that were born and raised within a five mile radius of each other—one living as a grazing animal and another as a browser where there is a limited amount of food. I had the opportunity to closely inspect two fawns of the same age, one from the farming country and one from the mountains. I would estimate that there was as much as 30 pounds difference in weight. From all appearances the better fed animal was far superior in quality of coat and bone structure. Conservation Education Assistant Robert Parlaman, Ligonier.

### Beaver County's First Beaver

**BEAVER**, Beaver Co.—On February 27, I made out a beaver affidavit for what I believe to be the first beaver taken in Beaver County in modern times. This valuable fur-bearer was taken in Darlington Township along the Little Beaver River. I have had beaver in the various parts of my district for the past several years, but this is the first one to be trapped. The trapper told me if he had known they were so hard to skin he would not have bothered trapping for them. District Game Protector J. B. McGregor, Beaver.

### Homegrown Foxes

**CLAIRTON**, Allegheny Co.—Life begins at forty for one lady in fox hunting. This lady, Mrs. Mary Recse, who is past forty, has taken her trusty shotgun and destroyed five



foxes in the last year. These foxes came into her yard and around the chickens; she has not gone from the yard to kill the animals. District Game Protector R. V. Rea, Clairton.

### Winter Notes from Bradford County

**CANTON**, Bradford Co.—I have seen more turkeys at the corn feeders during the past three weeks than at any time all winter. I counted thirty-

seven birds at one feeder on February 22.

Fawn deer are not in good condition. I have found three dead during the past three weeks on S.G.L. Nos. 12 and 36. We will have some winter kill if the heavy snow 10 to 18 inches does not leave soon. District Game Protector Duane E. Lettie, Canton.

### Partial Albino

**CLINTON**, Beaver Co.—Among a small flock of starlings, which come to feed at the feeding platform in my back yard, there is one which stands out from the rest. It has a light brown body and head, but its wings are entirely white. Last summer there was a pair of starlings nesting in my neighbor's poplar tree, one of them was an albino, but this one is not the same bird. District Game Protector D. W. Heacox, Clinton.

### More Ducks Wintering Here

**BERWICK**, Columbia Co.—A flock of about 30 black ducks are wintering on the Susquehanna River opposite the business section of Berwick. More ducks appear to be using the river and I believe it is because of the increased feed due to the cleaning up of the river. District Game Protector Lewis H. Estep, Berwick.

### Wildlife Likes Browse

**BLOOMING GROVE**, Pike Co.—During the months of January and February our Food and Cover corps has been engaged in the work of cutting a border edge around the food plots on S. G. L. #183 and 180. Upon checking over the amount of work done the following was noted. Deer moved in immediately to browse the tops of the fallen trees, rabbits worked on maple and apple prunings, and foxes also worked around the brush heaps created by the cutting without success since dense cover is afforded small game. While this cut-

ing work was being done one day round a plot on S. G. L. #180, I saw two deer browsing on an area that had been cut the previous day just 150 yards from the working crew. It seems that from this occurrence, the deer, hearing the power saw and the work, know or expect that a meal of browse is to be had. This is not unusual in most areas where there is timbering operation. District Game Protector Albert J. Kriefski, Blooming Grove.

### Crash Landing

GELATT, Wyoming Co.—While checking beaver dams during the past season, Deputy Felton and I happened onto one of nature's tragedies. We found the wind-dried carcass of a lying squirrel impaled on a barbed wire fence. It was evident that the squirrel had been "flying" from a maple tree to the fence when a barb had pierced a membrane "wing" and left him suspended to die a slow death. Deputy Felton said he had seen a similar accident a few years before. District Game Protector Donald G. Day, Gelatt.

### Man-sized Grouse!

WEST PITTSSTON, Luzerne Co.—During this past hunting season, Harold Schobert of West Pittston shot a grouse which must come close to being the granddaddy of all grouse. When weighed at two different grocery stores, it tipped the scales at 3 pounds 4 ounces! The average for November-killed ruffed grouse is about one and a half pounds, with few ever exceeding two pounds. Examination of its wing and tail feathers by the Wildlife Research Division revealed that the grouse was an old male. Deputy Game Protector Floyd Ramage, West Pittston.

### Spoken Like A True Sportsman

HUNTINGDON, Huntingdon Co.—In the latter part of small game season, a man from Newton Hamilton



was hunting wild turkeys in the Licking Creek area, Huntingdon County, when he accidentally fell and broke his leg. When he arrived at the hospital, and was being examined by the doctor, he kept saying, "Watch out, now! Be careful! Watch out now!" Finally, the doctor demanded to know whether they were hurting him, to which he replied, "No, but just watch out you don't break that turkey caller in my pocket!" Wildlife Protection Assistant Lester E. Sheaffer, Huntingdon.

### Hot Reception

STRASBURG, Lancaster Co.—I had an interesting thing happen when I recently liberated a cock bird where I knew there were some hens. The new bird did a lot of cackling as it left the crate, and settled down in a grove of pines. However, as soon as the stocked bird landed a native cock bird lit into and gave it a trouncing. This is the first time I have ever experienced this. What a fight! District Game Protector J. P. Eicholtz, Strasburg.



# Ammunition for the Bow

By Thomas A. Forbes

## PART I

**T**HE Science of Ballistics in the mind of the average person is confined to firearms and ammunition ranging from the single shot .22 caliber rifle to the batteries of 16-inch rifles in the turrets of a modern battleship.

When gun enthusiasts congregate around the open fireplace in the winter evenings the conversation will shortly fall into a familiar pattern and the ear will catch snatches of conversation where the words *head-space*, *rim-fire*, *cases*, *pattern*, *lands*, and *hollow point* fill the air and to the unformed make no sense whatso-

lows naturally that both the bow and arrow varied widely in material and design. In parts of the world where the bow is still the principal weapon of primitive peoples it varies in size and drawing weight from the light weight three foot bow of the Africar pigmy to the moderate weight eight foot bow of the Siriono Indian.

The bow is the controlling factor in the choice of an arrow. In the case of the pigmy bow the arrow is only a sharpened twig weighing about eighty grains, while the arrow used by the Siriono Indian is more than eight feet long and one inch in thickness.

The metal arrow was first intro-

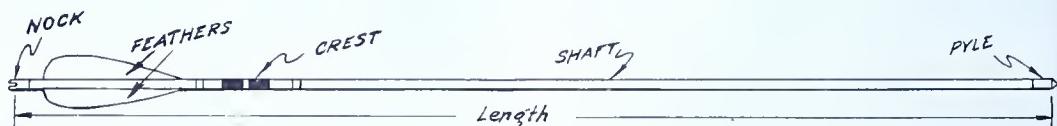


Fig. 19

ever. Volumes have been written since the advent of gun-powder on this one phase of the science and the end is not yet in sight. Ballistics in its broad sense covers a far larger field. Defined as the science or art of hurling missile weapons by use of an engine, substitute for the words missile weapon the single word "arrows" and for engine the word "bow" and we realize that the archer, as well as the riflemen, is interested in the Science of Ballistics and the glossary of archery terms is no less confusing to the uninitiated than is that of the riflemen.

Since the bow was in common use throughout the ancient world, it fol-

duced in competition in the year 1927 and at the Annual Tournament of the National Archery Association the Double American Round was won with metal arrows. Old customs die hard but in the years intervening since 1927 metal arrows have largely supplanted the wooden shafted arrows for target shooting, principally because their uniform quality, lightness and durability have resulted in larger scores.

The principal parts of an arrow Figure 19, are the shaft, pyle, nock feathers, and crest. The woods most frequently used for the shaft are birch spruce, Norway pine, and Port Orford Cedar. Inasmuch as arrows are

used for different purposes and consequently receive different kinds of treatment, economy dictates that the cheaper wood, birch, should be used or beginners arrows and knock-about shooting which is akin to plinking in the jargon of the rifleman.

the tree in the climate along the Baltic.

Wood shafted arrows are divided into two main classes; self arrows and footed arrows. Self arrows as the name implies are made from a single piece of wood. The cheaper grades of

*Fig. 20*

**BARRELED ARROW SHAFT (exaggerated taper)**

Medium priced roving, and hunting arrows are also made of birch. The wood shaft is still a keen competitor of the metal shaft in the hunting field and good quality hunting arrows are made of imported Norway Pine and Port Orford Cedar.

Birch is a tough, hard wood found in quantity in the New England states. Unfortunately shafts made from birch will not stay straight. However when a shaft warps it can be straightened by bending over the heel of the hand. While birch lacks pine in comparison to Port Orford Cedar, its added toughness is a redeeming quality.

Port Orford Cedar, which grows on the Pacific coast is a straight grained soft wood of excellent spine qualities and with proper care shafts made of this wood will remain straight. Any wood subjected to a wide range of changes in humidity and temperature will warp. To straighten shafts made from Port Orford Cedar heat the shaft at the bend over a hot plate or an electric stove. Be careful not to soften the finish on the shaft by applying too much heat and do not under any circumstances use an open flame. Hold the shaft in the left hand and straighten by bending over the base of the left thumb. Use care in bending so as not to injure the shaft.

Norway Pine from the forests adjacent to the Baltic Sea makes an excellent arrow wood. Its spine quality comes from the slow growth of

arrows are all self arrows and the price differential results from the kind of wood used in the shaft and the quality of materials and workmanship used in attaching the feathers which is called fletching.

When a hard tough wood is spliced to the head or pyle end of an arrow the shaft is said to be footed. The purpose of footing is to provide added strength and a durable wearing tip or fore-end to the shaft. Woods used for footing are lemonwood, hickory, birch, and purple heart.

Arrows are further classified by their shape. The circular shaft of uniform cross section is the simplest shaft to manufacture and consequently it is the shaft commonly used. It is generally manufactured in the following diameters: one-quarter inch, nine-thirty seconds, five-sixteenths, eleven-thirty seconds, and three-eighths inches. To secure additional spine (stiffness) without a proportional increase in weight throughout the length of the arrow, shafts are tapered at both ends and arrows made from such shafts are called Barreled Arrows. Figure 20.

Chested arrows have the area of maximum cross section of the shaft below and under the fletching and these arrows taper to the nock and head. Bobtail is the name applied to an arrow whose shaft has its maximum diameter at the head or pyle and tapers uniformly to the nock.

The flight arrow used for distance shooting is a long, light arrow from



Fig 21

twenty-eight inches to thirty inches or more in length, fletched with very small feathers or plastic vanes. Thin bamboo shoots are frequently used because of their strength and light weight to make the shafts of flight arrows.

Seamless metal tubing of both steel and aluminum alloy is used in the manufacture of metal shafted arrows. The metal shafted arrow is unsurpassed for its qualities of uniformity and durability. A set of these arrows matched in weight and spine, custom made, and fletched and crested to the archer's own specifications is a must in the tackle box of the skilled target archer. While the original cost of a dozen of these arrows is high, averaging around twenty-two to twenty-four dollars, with proper care the arrows can be shot season after season and the manufacturer will recondition the arrows at a cost of approximately fifty cents each.

The metal tip attached to the head of the shaft is called the pyle. Its

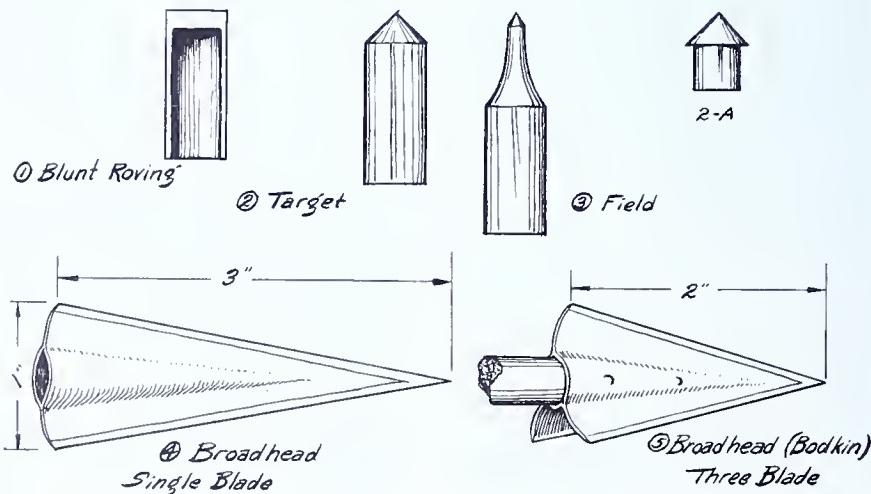
shape varies with the type of shooting for which the arrow is intended. Steel or brass are the metals from which pyles are made. Figure 21 illustrates one method of attaching the pyle to the head of the shaft. The head of the shaft is turned to a smaller cross section (a) and pointed so as to fit snugly into the hollow metal pyle (c). A small amount of Duco household cement applied to the tip of the shaft holds the pyle securely in place.

The illustrations shown in Figure 22 show several types of pyles commonly used and their names are indicative of the use for which they are intended. Numbers 4 and 5 are hunting heads for big game especially. Number 1 is used in small game hunting and has the advantage in squirrel hunting that it is not so liable to penetrate a limb and remain out of reach of the archer. The target pyle, number 2-A, of a metal shafted arrow is pressed into the end of the hollow metal tubing.

Broadheads and field arrows may also be purchased with metal shafts. Due to the high cost compared to wooden shafted arrows and the rugged conditions encountered in the field shooting the majority of field shooters use the wooden shafts.

To Be Continued

Figure 22.



# When Wildlife Needs A Friend

By Grace O. Beach

**S**TROLLING lazily through the garden this morning, it looked as if the young plants had added at least an inch to their stature over night. The song birds were flitting to and fro, busily gathering food and material for nests, active little home-makers, chattering and singing as they worked.

Out under the shrubs in the back corner of the garden, we discovered Mrs. Peter Rabbit plucking fur from her breast to line the nest she has dug there. This will be her second family this year and no doubt before long we will all be watching her babies playing tag on the lawn as we did her previous family.

Everywhere nature was fairly bursting her seams to send forth fruit and flowers, seed and cover, and young things to perpetuate the earth and the fullness thereof. The air was airy static with the rush of activity.

In the midst of all this ambition, our editor seemed to be the only aggard. Either it was contagious, or he ole conscience prodded forth a little matching energy. At any rate we decided that there were jobs that could be done to help things along.

True, we didn't feel much like working, but we cleaned and filled the birdbaths, did a little digging, weeding and fertilizing and decided to tackle the brush that had grown up under the apple tree in the far corner near the edge of the woods. As we snipped away at the outer edges of the rank growth, we had allowed

to get under way because of lack of time, we heard a peculiar noise. A little investigation revealed a hen pheasant on her nest, very much excited, but sticking to her job in spite of our intrusion.

Quietly, we retreated and gave up that job. We will have to keep a close watch now so that nothing disturbs her until she can hatch her brood. That job will probably never get done, at least so long as there are pheasants around that might wish to make it their nesting spot. We all spend many pleasant hours watching them at the feeders and picking their way gracefully and cautiously along the shrubs at the back of the garden. We wouldn't trade that pleasure for all the neatly clipped lawns in creation. Fortunately all the neighbors around feel the same way. Our young Junior Izaak Walton Leaguers will help to stand guard and protect the nest.

The spurt of energy was gone now, and we dropped into a lawn chair content to just sit there and let our eyes wander lazily over the landscape. How wonderful everything looked, so fresh, and so many various shades of green which have completely removed the drabness of a few short weeks ago. What a perfect setting for the brilliance of the early blooming tulips, the golden trumpets of the narcissus blowing forth its sweet perfume, and the delft blue of the little woodland flower that carpets the ground beneath them, we mused.

The golden notes of the thrush drifted through the air as a perfect symphonic background, punctuated by the sassy chatter of the wrens perched outside their house in the pin oak. Mrs. Wren raised two families there last year and we hope she will have





as good luck with them this year, we thought drowsily and then apparently drifted off to sleep and into a peculiar dream.

We found ourself lined up with a group of people, all assembled before a man, who seemed to be handing out the orders for the day. One after another, each person got their assignments and finally it came my turn. He looked at me for a time and finally spoke: "You haven't had much experience" he said, "but do the best you can, today you will guard all the little young wild children of nature."

There have been some rugged days, but never one so busy as this, nor an assignment so difficult. Dogs and cats seemed to be everywhere and had to be chased; young boys persisted in climbing trees after nests and had to be gotten down and sent about their business; other boys with guns had to be directed to other activities. There seemed to be always something to disturb the young babies and threaten their lives. The biggest job of all was acting as traffic cop and seeing that these wildlife youngsters were safely escorted across roads and highways. They all were full of adventure and wander-lust. No sooner was one taken care of than another popped into trouble.

About this time two cute little bear cubs chose the middle of the highway to put on a wrestling match, when all of a sudden a car came tearing down the road toward the unsuspecting pair. Every ounce of

energy was exerted in an effort to reach the pair before the oncoming car could hit them. Just as we reached them, something startled us out of the sleep and the dream ended. We will never know whether we saved the little fellows and completed our assignment or not. One of lifes little frustrations.

Completely exhausted from our efforts to protect these youngsters and intrigued by the oddity of the dream we sat there for some time just thinking it over. One thing sure we wouldn't want the job as a daily routine. There are too many dogs and cats left running loose by their thoughtless owners, and far too many boys and girls that have not been trained to let wildlife babies alone and give them protection instead of harming them. Then, too, young and old alike are forever carting home little wild babies, through the kindness of their hearts, not realizing that they are doing them harm.

All these things would make the job tough enough, but managing the traffic end of the deal would be a rugged one. Just how rugged can be seen from a recent release of figures sent to the Game Commission by Superintendent Pfeiffer of the Indiana Division of the State Department of Highways. He reports the following wildlife killed by traffic were removed from the highways of that county by his men last year: 2977 rabbits, 128 squirrels, 191 skunks, 46 raccoons, 862 opossums, 44 muskrats, 32 grouse, 6 quail, 139 pheasants and 67 deer, or a total of



492 wildlife creatures killed by automobile in that one county of the state.

There are 67 counties in the State and using that figure as an average, the toll would run over three hundred thousand birds and animals. That of course does not include those injured that crawled away to die, or were removed by predators.

We thought about the thousands of pounds of valuable wildlife meat, wasted through this careless slaughter. Take the rabbits for instance, their market value is conservatively estimated at \$1.20 each. The value of the rabbits alone would figure round \$300,000, or the daily bag limit of around 50,000 hunters, in round figures. If you want to figure out the amount of good wholesome meals that might have been enjoyed, one rabbit will provide three average servings.

Modern automobiles are taking a high toll of wildlife and would give any one assigned to the job of acting as wildlife traffic cop a real headache.

With summer coming along, highways will be filled with thousands of people, who will be traveling all over the state to enjoy one kind of recreation or another, or bound for some distant vacation spot.

All the coming new crop of young

wildlife, not yet trained to ways of traffic safety or how to avoid dangerous traffic hazards will soon be scampering about in youthful fashion.

The two are bound to meet.

Your Diana is certainly not experienced enough to handle such a situation, as the job dispenser in our dream so ably pointed out, but we can do our share in avoiding disasterous contacts with them in traffic. We can keep a sharp watch when driving, particularly in game country, and by driving with less speed be able to apply the brakes in time to avoid hitting birds and animals and still not endanger human life by slamming on the brakes when traveling at high speed.

We can try to enlist the readers of GAME NEWS to act as their own traffic cops, by doing the same thing, driving safely, cutting down speed and keeping a sharp lookout for wildlife creatures.

If we work together, we can help to cut down the highest toll of death to animals and bird life ever taken on our state highways.

Give wildlife a "Brake" and give yourself a "Break." After all, in driving carefully to save wildlife—"The life you save may be your own."

. . . *The End*

#### NOTICE OF COMMISSION RESOLUTION

WHEREAS, pursuant to the provisions of Act No. 564, approved January 14, 1952, the Department of Agriculture has given notice to the Pennsylvania Game Commission that the County of Susquehanna is infested with rabies; therefore

RESOLVED, that under the authority of Articles I and V of the Game Law, as amended, protection is hereby removed from raccoons, on the list of game animals, in the County of Susquehanna, as required by said Act, until further notice.

RESOLVED, that notice of the foregoing action shall be duly published in each County affected, in accordance with the provisions of Section 505 of Article V, of the Game Law, and that the Executive Director is hereby authorized and directed to certify the foregoing as a rule and regulation of the Commission.

Thos. D. Frye  
Executive Director  
Pennsylvania Game Commission



By Herbert Kendrick

## *The Gun Dog's Bell*

ANY article of equipment for the gunner or the gun dog which will increase the efficiency and pleasure of a hunt, while at the same time save considerable time and effort, surely merits thorough study and consideration. Our hunting grounds are thick with trees, brush, heavy cover, and our dogs are small enough to be lost from our sight when only a few dozen yards from us, and on the days when footing is damp and the going quiet, it is an impossibility to actually know the position of the fast-moving dog at all times unless he is equipped with

a bell on his collar which cheerfully signals his whereabouts. The dog is an important part of a bird searching team and it is very necessary to know where he is when his game is pointed so that the gunner may reach him in the shortest length of time, with the smallest amount of effort or confusion. I have heard of a few animals equipped with sufficient brains and superlative training that enabled them to find game sneak quietly away, return to his master and lead him back to the quarry, then proceed to repoint. I have never seen a dog perform in

his accomplished manner but I am sure it has been done on rare occasions by dogs possessing almost supernatural abilities, understanding the complete idea of shooting and blessed with a master having time and energy enough to train the dog to accomplish unusual and difficult tasks.

Personally, I would not care to have my dog leave his game to look for me because I feel that if he will cover a reasonable area, find game, successfully handle this game, the least I can do is keep up with him, locate him when he points and honor his find by flushing his game and cleanly killing one bird to reward his efforts.

It is simple and inexpensive to obtain a small sheep bell and attach it to a flat leather collar which can be fastened around your dog's neck the last thing before you release him in the field or woods. Even an older dog who has never worked with a bell will very quickly become accustomed to its sound and in a short time will associate the bell with hunting just as he does hunting clothes, the kennel wagon or the gun.

When the subject of a dog bell is raised, someone invariably advances the theory that a noisy bell clanging with every movement of the dog will surely frighten a wary game bird, thus making it more difficult for the dog to hold. This theory seems normally reasonable to the hunter who has never followed a dog carrying a bell. Many of my gunning companions use bells on their dogs and there are very few times when my own dogs are hunted without a bell and I have never known a game bird to flush from the noise of the bell. In fact, it is reasonable to believe that the tingling, musical sound may at times cause a bird to sit tighter in order to further study the new encroachment on his privacy.

The dog's bell enables the hunter to follow his every move, his rate of speed, and immediately when the sound is hushed, the gunner may make a direct approach to the dog, thus saving time and confused efforts of location. The time saved by a speedy approach may often be enough to get a shot at a wild bird that does not lie too well to a dog's point. The gunner walking in the woods laboring under a distinct fear that his dog may become lost on game, hunts under a handicap which a few cents invested in a bell can overcome. The confident gunner always enjoys more success than the fellow who is constantly afraid and confused.

The most successful use of the sheep bell on a dog is the woodcock and grouse hunting of Dr. Logan Bennett when he hunted with "Pat" in the State College area of Pennsylvania. I never saw Pat in the woods without the useful bell. For many years Doc has been a highly successful gunner, and his advice on training grouse and woodcock dogs can be safely used at all times.

Tom Frye uses a bell for his little cocker "Susie" when he finds time to hunt for grouse. She has learned long ago that the bell means a field trip, and you should see her enthusiastic response when Tom sends her for this useful piece of equipment.

Use a bell on your dog during training trips as well as open season time. Many trainers who are successful follow this rule.

To the beauty of the fields and woodlands the grace and style of fine dogs, the thrilling sport of gunning, add the merry tingle of a dog bell, and you will find another small improvement which will greatly enhance the gloriously thrilling art of shot gunning over bird dogs.

. . . *The End*



By L. J. Kopp

**W**HILE I do not pretend to be an expert on fur management, I do believe that the laws of Nature apply to all wildlife. We have often heard it said that there exists a definite relationship between our soil and our animal life, and that a given area of land can accommodate only so much. We can understand this more readily when we know that the basic wants of animals are food and comfort. When an area of land becomes overcrowded, these major wants can no longer be supplied, and it is then inevitable that the laws of Nature take their course.

This is not only true in animal life, but can be seen in plant and fish life, as well as human life. Down through the ages historians have recorded the rise and fall of empires. The want of food, peace, and comfort can be supplied only by our basic resources, and where these resources are depleted or destroyed, we find that greed develops and Nature takes its course in the form of wars.

We have two alternatives. The laws of Nature have shown throughout the years that we must maintain a balance. To accomplish this we must either harvest the surplus on a given area of land; or we must make the given area of land supply the needs of the growing population, be it animal or human.

Predation, cannibalism, and starvation are some laws of the wild but the various diseases among animals in the wild constitute a more serious challenge from Nature. Among these diseases, rabies is probably one of the most dreaded.

# The Law of Nature

During the past twelve years scientific research has firmly established that rabies and other diseases usually break out in areas where the infected species has increased to excessive numbers.

Economic reasons dictate that the most sensible way to maintain a balanced animal population is to harvest the surplus. Therefore in order to safeguard the future and prevent the laws of Nature from taking the course, our goal should be to maintain a balanced population.

In the case of our foxes, we have failed to accomplish this. There are those who would be inclined to attribute our increasing fox population to low fur prices or inadequate bounties, however there are many other contributing factors which are not so well known.

While it is true that financial gain is the prime motive for trapping, it is not the major guiding factor. Actually the number of persons interested in fox trapping has more than doubled during the past ten years. This is partly due to simplified trapping methods, and stepped-up efforts to teach fox trapping. Predator control was recognized long before fur prices dropped, and thus many persons are interested in fox trapping as a tool in wildlife conservation. In addition, fox hunting for sport has gained popularity during the past ten years. But foxes have continued to increase.

The time was years ago when farm youth was finished with his education after he passed the eighth grade, and thus he had more time

iring the season to become seriously interested in trapping. Trapping and going to school at the same time has disadvantages, as I know full well. Today a farm youth cannot afford to discontinue his education at such an early date; modern society requires higher education, and if the farm youth is to adapt himself to modern living standards it is rightly necessary that he continue his education in High School. Even farming requires special training today. From this it can be seen that comparatively few qualified trappers are recruited from the ranks of our farm youths. There is simply not enough time available for a farm youth to become seriously involved in trapping in this fast moving procession.

We have here one of the main reasons for our increased fox population. It is first of all obvious that the majority of farm youths are not lured by fur price, but by available time. Actually any fur price is a gain regardless of the amount, insofar as the farm youth is concerned, and in this case it would seem obvious that even if fur prices were higher the majority of our trappers would not trap any more foxes. It must also be considered that trapping is seasonal, and therefore few persons would be inclined to take trapping seriously when compared to a steady job in some other year round industry.

Lack of serious interest in trapping due to lack of time, not dictated by fur prices, and as such we have quantity rather than quality. In other words we have more trappers today, but not enough who can qualify as serious trappers.

We must also understand that national emergencies have taken many good trappers from active trapline duty. While many are called to serve our country, both in the Armed Forces, and in other important defense work we would do well to recall that this situation has existed for twelve years or more. Some of our

trappers never came home, while many of those who did, never returned to trapping for various reasons.

In addition, some of our better fox trappers have been led away from the trapline by higher wages and easier work in other fields.

Too many trappers today appear to be interested in competing with modern society, rather than follow the trapline. This same principle is true in the entire conservation program. People today no longer go into God's country to find peace and comfort, instead we let ourselves be entertained by such things as television and radio among others. In the meantime our life-giving resources are dwindling away. Our trapping is dwindling away because we are letting ourselves be lured into the modern trend of high wages, less work, and artificial entertainment.

Those trappers who excuse themselves from active trapping with the impression that foxes are not worth trapping merely are not willing to take the bad with the good. It would however be better to trap foxes at four dollars apiece rather than let disease take its course.

It is safe to say that today we have from three to ten foxes where years ago there might have been one or two, or none at all, and for this reason a trapper can still earn a fair wage on the trapline. The only difference today is that it requires more time to compensate for lower prices. Most of our trappers and hunters today are taking all the foxes they possibly can, but unfortunately our trapping population is being thinned out steadily as outlined previously, and it is evident that the younger generation of trappers is not filling the shoes of those who are leaving the trapline.

There is another angle to consider; we have some good fox trappers who for various reasons are not in a position where they can afford to trap

foxes, but here, too, the number of such trappers is very limited and even if fur prices were higher, the trapping which such trappers would in all probability do, would have little effect on our fox population.

Then too, there is the type trapper who insists that he will not trap foxes because of low fur prices or inadequate bounties in spite of the fact that he knows literally nothing whatever about fox trapping. Such a trapper could not trap foxes successfully if he wanted to at twenty dollars apiece, but he makes the mistake of comparing fox trapping to modern high wage trends. Actually fox trapping, or experimenting with the art would be profitable to such a trapper if foxes were not worth a penny. It is almost foolish not to experiment with fox trapping while waiting for higher prices. Fur prices mean nothing if you do not know how to trap, and certainly the experience gained now would be worth more than the loss which one would experience later as a result of lack of trapping knowledge when prices are more worthwhile. Sometimes I think we have more of this type trapper than any other kind. It seems to be easier to say that fur prices are too low than to admit one's ignorance of fox trapping.

From this discussion it can be seen that the reasons for our increasing fox population are as follows:

Modern living standards, educational standards, and our sound economic system, no longer allow sufficient time for serious trapping, whether fur prices are high or not.

Defense work, and war has taken many trappers from active trapline work, and these trappers are not being replaced by the younger trappers.

The modern trend of less work and high wages lures many trappers away from the trapline.

A limited number of trappers are more concerned with high fur prices or higher bounties than with the call of the trapline.

Last, but by no means least, are the trappers who blame low fur prices rather than admit their inability to trap successfully.

In view of these existing circumstances it would seem extremely doubtful that either high fur prices or higher bounties would make any sudden changes in our alltime high fox population. We simply do not have a sufficient number of serious minded fox trappers.

In addition to what I have already explained we must also consider the fox's cunning. Improperly used fox trapping methods go a long way in educating the fox to avoid traps, and this plays more than a minor role in encouraging an excessive population. The fact that Pennsylvania is ideally suited throughout for fox must also be taken into consideration. Propagation is further encouraged when we recognize that the fox is not limited in natural food supplies, nor is his ability to obtain food limited. This helps the animal to survive the year round, in all weather conditions, anywhere in any locality.

What we need therefore is real determination. We have a challenging problem, not of propagation, but of harvesting the surplus before the laws of Nature do it for us.

. . . *The End.*

## WINTER TRAPPING IN THE NORTH COUNTRY

Trapping fur bearers is not the easiest way to make a living anywhere in the world, but is particularly difficult, uncomfortable and dangerous in the frozen North Country of Ontario and Quebec. The following account, reprinted from an Ontario Department of Lands and Forests news release, contains numerous notes on the weather, trapping regulation, trapline practices and management etc., that should be of interest to Pennsylvania trappers.

"Rupert House, James Bay—One thousand miles north of Toronto, 300 miles from the nearest highway, the ardiest men in the country are carrying on their daily occupation of trapping. Each morning they leave crude lean-to's in the bush, step into their snowshoes, harness their dogs, and start out on trips of anything from 15 to 30 miles in temperatures ranging down to 40 below zero. At night they return with their heavily laden sleighs, thaw out the beaver, mink, muskrats they have trapped and start the messy business of cleaning and skinning.

"This is what the country looks like; seen from a low-flying plane of the Ontario Department of Lands and Forests: Ice extends out about 50 miles from the shore of James Bay; beyond that is low ice-fog and open water; to the east, the land covered sparsely with low evergreens and willows along the river banks; Hannah Bay is cold and inhospitable, covered with ice. The Quebec-Ontario border is a narrow strip ripped through the bush as far as the eye can see; beyond that, the Abagge Willows River has banks that seem as sharp and straight as those of a canal. And right down the center of this winter highway one, solitary set of snowshoe tracks. Occasionally they deviate into the banks where the trapper has set his traps. At wider intervals, his overnight lean-to may be spotted from the sky. Sometimes there's a trail of smoke rising into the frosty sky. Three or four husky dogs may be seen tied to the trees or curled up in the snow."

Far down the ice of the bay itself, a cloud of snow indicates that the fur management officer, Tom Tyrer of Moose Factory, may be using his automobile to travel up the rough, dangerous trail of the bay, visiting the traplines or the Hudson's Bay posts which are scattered at intervals roughly one hundred miles from Moose Factory to the Arctic Circle.

The snowmobile, a half-track vehicle with skis for steering, is as necessary in this country now as the automobile of the city dweller. No car, however, could operate in the snow here. Tyrer, before starting out on his rounds, makes sure his anti-freeze is a 50-50 mixture of glycol and water, "good" to 50 below zero—a temperature frequently encountered.

He carries full emergency equipment—tent, rifle, explorer's stove, snowshoes, sleeping bag, food. For, despite the sturdiness of the present-day snowmobile, the heavy going does bring mechanical failures at times and he must be prepared to snowshoe anywhere from 50 to 60 miles between posts. Recently, the Lands and Forests Department equipped his machine with a portable short-wave radio capable of two-way communication with the Hudson's Bay Company posts.

Tyrer checks the number of beaver taken under the zoning regulations provided by the Department and adhered to by the Indians. The rule says "one beaver per live house." Usually there are six beaver in a house, a parent pair and four young. One of these young, according to the Indians, almost invariably dies, either from disease or perhaps killed by predators. By taking one animal, good management is ensured. There was a time, before the zoning programme, when trappers were allowed to take only ten beaver. Now they take anywhere up to fifty or more depending on how many houses there are on the trapline. The pelts are sealed, sold at the nearest post and then packed for shipment to England where they are mainly used in the manufacture of felt for fine hats.

Despite their long hours and their lonely, dangerous work, the trappers aren't too highly paid. Beaver prices this year have dropped down to around \$23 for the finest pelts. There have been times when they brought as high as \$70. Munro Linklater, chief of the Moose band of Indians,

claims that the present prices is so low that it is definitely not worth while. He is presently debating whether to leave his trapline for the season, allowing the beaver to increase still more for next year. But, he says, there's a danger in that. If the beaver increase too heavily, they may flood themselves out of house and home, destroy their own breeding ground, and kill themselves off. He blames no one for this unfortunate state of affairs. He believes the trapline management plans of the Ontario Department of Lands and Forests are excellent, and says so. But he does

wish that men and women of North America and of Europe would once again adopt the beaver coat as a symbol of luxury and wealth, so that the demand would increase and prices go up. Last year, his fur catch brought him \$2,300 an income he implemented by guiding hunters during the James Bay goose season. This year, so far, he has taken eighteen beaver which brought him about \$400.

But, regardless of prices, those solitary snowshoe tracks can still be seen along the Cabbage Willow River.

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## NATURAL FOODS ATTRACT DUCKS

Pennsylvania duck hunters are becoming increasingly interested in management programs that will improve their sport. They have so far promoted two projects principally—the establishment of new pond or marsh areas and the erection of wood duck nesting boxes.

Just as hunters for other game have learned the relation between ample food supplies and large wildlife populations, duck hunters have come to recognize the need for natural waterfowl foods in quantity. Duck men naturally want the migrants to stop over in this state to raise broods or to tarry here enroute south in the waterfowl season.

To hunters who have asked about the planting of preferred duck foods and where seed may be obtained the following information is offered.

1. Marsh water and soil tests should be made before seed is planted. If duck foods are to be planted on stream or pond banks or mud flats, tests should also be made of the soil there. If such preliminary

tests are not made money and effort may be wasted. Some desirable plant species require alkaline soil, while others thrive on acid soil. County Farm Agents will make these soil and water tests for sportsmen.

2. With test results at hand houses selling aquatic seeds will be in position to intelligently recommend plants that will grow under described conditions.

3. Wild rice, wild celery, wild millet, sago pond weed, smartweed, and widgeon-grass are considered some of the better waterfowl foods that may be planted.

4. Names and addresses of dealers who sell aquatic plant seeds may be found in leading outdoor magazines, in which they advertise.

For years, the Game Commission has planted waterfowl foods in the Pymatuning Refuge and marsh areas. With the new duckling program in full swing the agency is expanding its planting program wherever possible, mainly on game lands and other state holdings. In some cases, corn and other grains are bought and left standing in fields near water where ducks stop during fall migration or stay over winter.

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PENNSYLVANIA

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# THE STORY BEHIND THE COVER

"**H**E'S callin' for rain," the old-timers say when they hear the doleful cry of the mourning dove. But the "rain dove" is merely singing because he *wants* to, and his song is as frequently heard *after* a rain as before.

This trim, streamlined relative of the extinct passenger pigeon is one of the farmer's principal allies in the control of undesirable weeds, for its diet consists chiefly of weed seeds and waste grain.

Mourning doves mate for the entire year, regardless of the number of broods raised. The male is a devoted mate, assisting in the construction of the nest, the incubation of the eggs and the feeding and rearing of the young. The squabs are usually two in number and are fed on "pigeon milk," partially digested food regurgitated by the parent birds. The nest is a flimsy affair made of sticks and constructed so loosely that the eggs seem in constant danger of falling through to the ground below.

Although a few individuals remain with us during the winter months, the mourning dove is considered a migratory species, and during the autumn months leaves Pennsylvania for its winter home in our southern states.

As a game bird, the mourning dove is not particularly popular in the Keystone State. Its gentle manner and pleasing appearance seem to cause sportsmen to forget that it is now recognized as a game bird in our state. Nevertheless, the dove really deserves a place in that classification, for its flight is extremely swift and with a stiff tail wind to add eccentricity as well as speed to its flight the long-tailed bird with the whistling wings is definitely an exasperatingly difficult target.

Authorities still receive reports of "passenger pigeons" which always prove to be none other than the common mourning dove. The true passenger pigeon was a larger bird and has been extinct since the last captive specimen died in the Cincinnati Zoological Park in 1914, a martyr to man's greed. Once present in enormous flocks that darkened the sky, the passenger pigeon was shot and netted for the city markets until not a trace of the splendid birds remained. Fortunately, present-day game laws effectively guard against the mourning dove's experiencing the same tragic end that befell its famous cousin.

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by the  
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Commonwealth of Pennsylvania  
JOHN S. FINE, GOVERNOR

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If there's one thing on which most hunters can agree it is the belief that hunting is the most pleasant of all sports. Whether one seeks the lowly cottontail, the swashbuckling ringneck, the wary grouse or the crafty whitetail, a hunter's life is filled with happy anticipation and soul-satisfying memories of days afield.

To 386 gunners, however, the sport has likely lost much of its appeal. These are the unfortunate victims of non-fatal accidents that occurred in Pennsylvania last year. Twenty-five more will never again see the November sun rise above the purple hills—the statisticians call them "fatalities."

The article "Annual Hunter Casualty Report" on page 50 of this magazine tells the story—in figures, that is. There's nothing in those figures to describe the suffering, the heartache, the ruined lives and shattered dreams that attend disasters of this sort. And the ironical part of it is that practically all of these "accidents" could have been avoided; most of them were the result of carelessness or downright greed.

What can be done about it? The answer is *education*. The hunting field is not the place to learn firearm handling by trial and error methods. You can't give an inexperienced hunter a gun, turn him loose in the fields or woods with no instructions and expect him to be the epitome of safety. Common sense will do wonders, but he needs more than that. He must be taught the two fundamental and inviolate rules of safe gun handling, "Never point a gun at anything you do not wish to shoot" and "Handle every gun as though it were loaded." He must be taught to be absolutely certain of his target. He must be impressed with the foolhardiness of placing his gun in a dangerous or insecure place. He must be taught the importance of cool thinking afield, and the disastrous results of greed. No rule of gun handling should be overlooked; no breach of the rules should be tolerated. He must learn that the least he owes in return for the privilege of hunting is a constant concern for the safety of himself and others in the field.

Education and re-education of our gunning population is a tremendous task. The Pennsylvania Game Commission is tackling the problem with instructive motion pictures and literature, and through its Game Protectors and Conservation Education Assistants. Many sportsmen's clubs are taking the embryonic shooters of their communities under their wings, and numerous individuals are "taking a boy hunting." But these attempts at safety instructions, though commendable, are merely scratching the surface. For every lad who is thoroughly and properly trained there are a thousand who are potentially dangerous through insufficient instruction. Until the youth groups, the sportsmen's organizations, the schools, the individual sportsmen, and the parents of young shooters realize the vital nature of such instruction we can expect no decrease in hunting tragedies. Will next year's reports again say "Dead—25, injured—386"? It's up to YOU, my friend.





# *Allegheny National Forest*

## *A Lesson in Cooperation*

By Grace O. Beach

ONE day early in July 1949, two men faced each other across a desk. Between them lay a new agreement. A deep silence settled over the office broken only by the scratching of the pen as Ross Leffler, at that time President of the Pennsylvania Game Commission and R. M. Evans, Regional Forester of the United States Forest Service affixed their signatures to the document, binding their two organizations to work together in the Allegheny National Forest on a cooperative program for the management of its Wildlife Resource.

No fanfare or publicity marked the occasion as anything out of the ordinary. No photographers flash bulbs sent their blinding lights over the scene as the two men shook hands. There was not a single sign in the whole transaction to signify that conservation history was in the making.

The few people who knew about the compact were heartily in accord and hopeful of its outcome, but with tongue in cheek. How could it be otherwise, for generally speaking, "cooperative" has come to be just another word, dulled and meaning-

less by repetition and lackadaisical in action, in spite of the fact that the dictionary defines it as a word of action meaning—"working together for common ends."

The hardy hopefuls sat on the sidelines and waited. After all, it takes time to get any program worked into shape and functioning, they reasoned. As month followed month without any apparent show of action, a feeling of disappointment began to develop among the less optimistic, they figured this cracker was just another sizzler. Then things began to happen.

Splutters of enthusiasm started to filter through the becalmed atmosphere, followed by a regular shower of sparks, as hopes soared again. The sideliners settled back expectantly waiting for the next act.

The party of the first part and the party of the second part, partners in the agreement, began to wax enthusiastic about their several accomplishments, but when they started gloating over their partners accomplishments our curiosity got the best of us. Apparently the word cooperative had been dusted off a bit, it's



Photos by the author.

*Top—Mr. Melton, Pennsylvania State College faculty member, and Mr. Costley, Forest Supervisor of Allegheny Forest.*

*Center—Fun in the recreational area.*

*Bottom—Ducks on the Forest's waterfowl sanctuary.*

glitter was showing. We wanted a look behind the scenes.

Unashamedly, we angled for and received an invitation to come back stage and see the results to date, and tour the forest to the points of interest.

Accordingly, very early one Saturday morning, the alarm jangled a steady din. Sleepily, the writer groped to shut off the racket, while one eye managed a sneak preview of a new day. It was still dark and that unusual fact brought startled reaction. There was a long drive ahead to keep an appointment at eleven.

Our party arrived at the Ranger's station at Marienville on schedule. Waiting to greet us was our host, Richard Costley, the Forest Supervisor of Allegheny National Forest—the only Federal Forest in Pennsylvania.

After the usual greetings and introductions, we were briefed on the schedule set up for our visit. On the wall in the Rangers Station is a big map of the Forest and our route and points of interest were traced so we would be fully acquainted with the area through which we would travel. Then we climbed into a car and started on our trip through the forest.

Enthusiasm is contagious and you're not in the company of Mr. Costley very long before you begin to feel you have picked up the germ. As we drove along the well-kept forest roads, Dick told us of the plans and policies followed in the Forest Service and how the agreement came into being. We learned that in administering the Country's National Forests our Forest Service is actually responsible for about 1/10 of the Nations entire area, that in this vast domain wildlife is considered as a primary renewable resource, to be managed as any other forest resource for its permanent protection and use, and at the same time to insure its

full contribution to human happiness and well-being.

Those who shape the policies of this organization firmly believe our forests are becoming increasingly important in preserving and restoring this basic resource, since the forest is the natural home of so many kind of birds, fish and animals. That belief has become their national policy.

To carry out this policy they must work in as close cooperation as possible with the conservation agencies managing the wildlife resources within the states where the forests are located, Mr. Costley pointed out. Every sportsman knows that their Game Commission in the Keystone State wholeheartedly subscribes to this policy as do the sportsmen whose hunting dollars support their Commission's activities. It was natural then, that the agreement would receive their approval.

We asked about the size of the forest and learned that it is 37 miles long and 43 miles wide. The Allegheny River forms its western boundary from the New York State line south to Tionesta. The Clarion River forms most of the southern boundary, and U. S. Highway 219 closely follows the eastern boundary to the New York State line on the north. Within these boundaries lie approximately three-quarters of a million acres of which nearly half a million acres are now in public ownership. The forest is contained within the four counties of Warren, McKean, Forest and Elk. It was established by proclamation of President Coolidge on September 24, 1923 and for ease of management is divided into four Ranger Districts. However, because of currently limited funds only two district rangers can be financed. The Southern District Headquarters is located at Marienville where we came into the forest and the offices of the Northern Districts are located at

heffield. The Supervisor's office is located at Warren.

It was interesting to learn that in the early days of settlement in this country, this land was once claimed or the King of France. Today, it belongs to over 150 million Americans, who are its stockholders. Fifteen million of these Americans live within 100 miles of this beautiful National Forest easily accessible for their enjoyment and pleasure. It is a fair supposition that the king in his most extravagant dreamings could never have envisioned any such situation.

As we had been talking, we drove through the southern tip of the forest, stopping to see the Loleta Forest Camp. It is one of the eight developed recreational areas providing picnicking, camping and swimming. Tables, firegrates, storm shelters, drinking water and firewood are provided free at all of these camps except at Loleta and Twin Lakes where a small fee is charged.

After that we swung over past the Zimmerman Hill Fire Tower. There are ten State and Federal lookouts in all and trained personnel are maintained to locate and put out fires, because wildfire is an ever present danger and the worst enemy of the forest. The State and Federal Government cooperate very closely in guarding the area and fighting fires.

Continuing, we came to one of the nearly forty summer home areas in the forest. Certain areas are set aside for this purpose and several hundred special use permits have already been issued for forest summer homes, hunting cabins and residences which have already been built. We stopped to look at several and at the type of construction which fits so charmingly into the natural background, one of the requirements of building on our Federal Forest land. Other sites are available, and any one desiring to obtain the use of one of these sites can get full information at either of the Ranger Stations or the Supervisor's Office.

By this time we were all hungry and lunch was a very pleasant experience. We stopped at the Penn State Forest Summer Camp or Field Training School, which fortunately was in session, and were greeted by Mr. Rex Melton who is a member of the faculty of the Forestry Department of Pennsylvania State College. We all joined the students, lined up along the cafeteria counter and came away with full trays reminiscent of logging camp days. The food was delicious and there was plenty of coffee and milk served in big pitchers at each table. Students and guests alike did full justice to the fare.

This school we learned is conducted by State College and for at least two months and before graduating with degrees in Forestry the students are required to get actual field participation and learn first hand some of the basic forest work. It is an annual session and the students are housed in buildings which were formerly used as a CCC Camp, one of the first in Pennsylvania. The entire camp is on Government land and is operated under permit from the Forest Service.

Lunch over, we thanked our very genial host and started out again. It was with considerable reluctance on the part of the author, for here among this class was a very good story of the aims and ambitions of these young men who were training for future conservation work. But that will have to wait until later.

Our next stop was at one of the forest plantations, where young trees had been planted in an area that had at one time been burned over. They had a healthy start and would in the near future reach the size where they would provide the necessary cover to hold the soil, preserve the water supply, supply food and cover for the forest animals and form an integral part of the areas future timber resource. How much wildlife food they supply was very noticeable when we stopped at one of the experimental

plantation areas. Here a fence had been put up around a part of this plantation to protect it from browsing and to permit it to grow without competition. Inside the fence, the trees were about 9 to 10 feet high, but outside the enclosed area, trees planted at the same time had either been killed outright or were not much over three feet high. Those that had survived the constant cropping of the fresh young yearly growth by the over abundant deer were stunted and dwarfed. There is a magnificent deer herd in the Allegheny Forest but when the population is too great for the natural food supply area it is almost impossible to get young trees started. Trees that do make the grade require many years before they become of value to the overall picture. Here was proof conclusive.

There are some 12,000 acres of successful plantations on the Forest, about 5,000 acres of plantations have failed, principally because of the deer over-population and 25,000 acres still need to be planted. It is estimated it will take at least 60 years to finish the job figured at the present rate of progress. This average includes the acceleration of CCC days. This gives some idea of the ravage the axe and fire has caused and the time and expense involved in restoring the damage done. Most of this could have been eliminated under proper management, and fire safety and control and there would have been little or no need for such a tremendous undertaking. The task these men are concerned with as they fight the long drawn-out battle to replace the resources we have so carelessly dissipated, and which even yet we regard so lightly, is awe-inspiring.

It was interesting to find out that according to the latest inventory there is a growing stock of a half billion board feet of saw timber and about five million cords of wood. This capital stock provides an an-

nual harvestable growth of around 6.7 million board feet of saw timber and 125,000 cords of wood. This is done by selective cutting, which means that trained foresters go through the areas and mark the trees to be harvested. Only these marked trees are removed and the others are left to grow. Through this method of selection the better trees and saplings are saved and exposed to the light and air and enough sun is permitted to enter to bring up the seedling trees and allows room for the expansion and growth of young saplings remaining.

This type of management permits annual cropping, assures future sustained supplies and still maintains the highest type of watershed conditions, and productive wildlife habitats.

Water is recognized by the Forest Service as the most important single item which can be produced on Allegheny National Forest, the watershed of the northwest. This becomes particularly important in face of the fact that water tables are falling steadily. Heavy industrial concentrations drawing on the underground water, faster than it is replaced, has caused this alarming situation in many areas. Towns and communities are suffering from this diminishing supply and every effort must be made to hold the present supply and to try to rebuild this stream of life. The Allegheny National Forest is showing one way of attacking the problem.

About 50,000 people are directly dependent upon the National Forest for their water source and five communities are more than 40 percent dependent upon it. Every Pennsylvanian is indirectly dependent upon its watershed protection in other ways too numerous to mention, but some of them very vital.

The water problem in all of Northwestern Pennsylvania, as in any other section of the county, requires the most careful management and every



Photo by the author.

*Vegetation outside fenced-in area shows effect of overbrowsing by deer. Small pine tree indicated by arrow was planted at the same time as those inside fence.*

ort of precaution to guard their present supply. Water is one of our most precious possessions. Without it we would become an arid desert and every living thing would cease to exist.

We visited one of the three areas of the forest that have been set aside for bird dog trials. Here some of the most important bird dog trials in the country are run, including the Grand National Grouse Dog Championships. Approximately 3000 acres of the National Forest are designated for this use and it is managed by the Forest Service in cooperation with the Pennsylvania Game Commission.

That brings us to our real reason for the trip and our next point of interest, the work done by the Game Commission and the Forest Service under their cooperative agreement. We had passed a couple of areas where we could see from a distance some of the work being done, but the softness of the ground due to heavy

rains did not permit our reaching them. We visited others where the work had been completed or was nearing completion, and still other section were pointed out where future plans called for renovation and food and cover work.

Nearly a hundred thousand hunters of big and small game spent some part of last hunting season in the Allegheny National Forest. Those who did hunt there probably passed at least one sign marking these plots.

The signs are not elaborate, but they do proclaim the fact that this particular plot is part of a food and cover project for better wildlife habitat, carried out by the Game Commission and the Forest Service in cooperative agreement. Probably the greater majority of the hunters, not being familiar with this program passed them by, too intent on their sport to notice the signs, or take time out to bother reading them. The program has not had a great deal of

publicity and its accomplishments are not yet sufficiently well known to attract as much attention as they should.

The cooperative work so far as the Game Commission is concerned, is done equally by two divisions. The Northwest Division under the jurisdiction of Temple Reynolds, and the North Central Division under the supervision of M. E. Sherman, the supervisors of these two Wildlife Conservation Divisions of the Game Commission.

Each Division has a crew which carries on this work. Trimming out apple and other fruit trees and pruning them so they will produce better results is one important project. Trees that once had a scattered few fruits now hang heavy with food for wildlife. Grass and grain plots they planted are waist high, where once they were practically barren or unproductive. Grape vines have been released so they can provide food and cover and the cuttings are planted in other areas, stepping up the supply. Border cuttings and plantings are made, and watercress and other waterfowl foods are set out. Feeders are constructed and kept filled during the need for winter feeding. All this work on the National Forest is accomplished by the Game Commission in addition to the regular work of the Divisions.

State hunting rules prevail upon the National Forest and of course regular law enforcement work during the hunting season is carried on in the National Forest the same as on the Game Lands and other areas.

We saw all this work that had been done, but it was impossible to estimate the tremendous impact of their accomplishment, so we contacted Mr. Reynolds to learn the approximate amount of work already done under this program by the Northwest Division. He was most cooperative as always, and here are examples of some of the astounding results.

The group cleared 89 acres for planting, and planted a total of 128 acres to grain and cover crops. They released 3827 fruit trees and pruned another 2574. Some 1300 wild grape vines were released to grow and reproduce and 313 acres were planted with release cuttings. Three small ponds were constructed and 1200 pounds of waterfowl food plants were set out, together with an additional 8 bushels of water cress planted at springs. Seedlings for food and cover plants amounted to 28,771. Five turkey feeders were constructed and 1500 bushels of corn fed in 1950. The same amount purchased for 1951.

Mr. Sherman was contacted and equally as willing to cooperate in supplying the overall picture, for work accomplished by the North Central Division, covering McKean and Elk Counties they have this equally astonishing accomplishment to their credit.

Fruit trees released from competing species of lesser value to wildlife amounted to 3714, and 3469 fruit trees were pruned. 138 acres of forest edges were especially treated. This means the clearing and cutting of 30 to 70 foot strips at the border of field and tree plantations to encourage sprout growth.

Management policies of the Forest Service permits special wildlife cutting and clearing at the rate of at least one acre situated every half mile, Mr. Sherman informed us. These cuttings are located and made at advantageous sites scattered throughout the forest and benefit wildlife by creating forest edge sprout growth, dusting sites and the opening of the solid canopy of the forest for light and air. In this type cutting 88 acres were cleared. In addition wildlife values are taken into full consideration in connection with all other activities in the Forest Service.

18,500 fruit bearing seedlings were planted along edges of clearing and plantations by this group. 14 food

lots totaling about six and one-half acres were planted to cereals. 17 plots 10 foot square were dug up and seeded to grasses in the clearings made under the forest cutting projects. 12 bushels of water cress were planted at springs and spring runs in an attempt to get it established in the water areas. 6 seep areas were developed to provide feeding areas during winter months. Beaver dams have been planted to waterfowl food plantings amounting to about 16 acres in this area ideally suited to wild waterfowl.

These figures are constantly growing as the program progresses and no doubt have increased considerably since our visit last fall.

Each Division has a slightly different management problem depending upon the type of terrain. Considerable time had to be spent in surveying and working out plans and actual reconstruction work has been underway just about one year now.

Actually most of the field work is done by the Commission, but all of the work is based upon plans that are jointly made by both the Commission and the Forest Service. This requires an annual overall policy and planning meeting of "high level" personnel and a monthly session in which the Commission's crew leaders and the Forest Service's district Rangers locate and plan the specific jobs, with all their details. You can see that this is necessary in order to properly integrate the direct wildlife work of the Commission with the many Forest Service activities—such as timber cutting, etc., that might have an effect upon the wildlife habitat.

Any sportsman who knows anything about this type of work will agree that great things have been accomplished in a short period of time by these two crews of Game Commission personnel from the two divisions who are carrying on this work in the Forest, especially in view of

the fact that there are only a few men in each crew.

Is it any wonder that they are all highly pleased with their accomplishments and their working agreements, and enthusiastic about the program. Any person engaged in, or interested in, conservation work and knowing the tremendous need for this sort of program in our state could scarcely see otherwise. Sportsmen who have so long fought for this type program in Pennsylvania should be equally enthusiastic.

We stayed in Warren Saturday night and early the next morning were back on some of the many miles of roads in the Allegheny Forest, visiting other points of interest in spite of a heavy drizzle of rain.

One of the most interesting adventures of the day was a visit to Heart's Content, the virgin forest area, and to walk beneath those towering pines and hemlocks. What stories they could tell if they would. This area has been set aside by the Forest Service and will be retained as is, to delight the coming generations of Pennsylvanians and guests.

We also stopped to see the trout rearing station where the United States Fish and Wildlife Service in cooperation with the U. S. Forest Service rear 45,000 legal trout for stocking the 500 miles of trout streams that wend their way through this forested paradise, supplemented by trout from the state hatcheries.

No visit to the forest would be complete for any sportsman or sports-woman, unless they visited the Sill Run project and saw first hand what a group of stout hearted sportsmen can do on their spare time when they have the will and a place in which to work. Here is a perfect example. The men from the Warren Field and Stream Club assemble here on weekends and work on an area provided by the Allegheny National Forest. They have done a splendid renovating and food and cover job on

this their particular project. They are mighty proud of their job and they have every reason to be. There were many blistered hands, aching backs and weary men when each day's work was done, but they had a lot of fun and pleasure too, in the companionship and accomplishments. There is nothing so self-satisfying as to stand back and look at a job well done.

Finally, the time had come to wend our way homeward. There were still many things to see and things to learn. But that will have to wait till another time. We were very appreciative of all the time and special attention we received at Mr. Costley's hands, and his patience in explaining in great detail all the many angles, and we were doubly grateful that he had devoted his entire weekend to our visit, making it a long work week for him. We thanked him to the best of our ability and started home through the Kinzua area.

Now that spring and summer is on its way the sportsman can divert his attention from hunting to other things, and it's a good time to take a trip to our State's only National Forest and see these places for yourself.

The things that are taking place there are the basic fundamentals that make sports afield tick to the tune played by over a million hunters in the Keystone State and their out-of-state guests. It's a good place to get a look behind the scenes and judge for yourself how well conservation agencies and your Game Commission can work together cooperatively for the common good.

When you come back, we think you'll agree with us that the Game Commission and the U. S. Forest Service have dusted off the word *COOPERATIVE*. Its glitter is definitely showing; conservation history has been and is being made.

. . . *The End*



Photo by Ervin Transue.

*Here's proof that wild animals are not immune to accidents. In what was probably a frantic effort to escape pursuit this Pike County antlerless buck tried to leap through the fork of an oak tree. Instead, his body became wedged in the tree until starvation and exhaustion halted his struggles.*

# Outdoor Reveries

## High Noon

By John H. Day

OUT of the violet dusk of the June dawn another Summer came stealing across the hills from the south. The countryman watched the gorgeous tiger swallowtail flutter down the woodland aisle and know that Spring had played out her yearly role. Surely all the glow of Summer is concentrated in this most beautiful of all our butterflies. The countryside lay fresh and clean, new-scrubbed by a Saturday bath which set in early in the day and poured long after nightfall. Then came a driving breeze which scoured the sky and drove the tall grass before it like a green flood of roaring water. Only Summer grass thus flows beneath the gale.

The Summer does not explode as does the Spring. The Spring promises and delays, approaches and withdraws, then suddenly swoops upon us in the smothering delight of her full presence. the Summer comes graciously forward, announced by a thousand heralds. The calendar calls for Summer to arrive with the solstice about June 21, when the sun "stands still," but the countryman knows that already there is not a spot on hillside or in lowland that does not glow with the fact of Summer's arrival.

There was no sound of revelry by night. The gay carnival whirled in silent pageantry, dancing through the



Neo Smith

gloaming and on into the dark hours. Fairy lanterns carried by the revelers floated lazily above the wide grassy bottomlands as fireflies by the tens of thousands danced to the rasping fiddles of the cricket orchestra. No moon rose up to mar the brilliance of the stirring spectacle. Etched against the black wind of the night, the sudden luminous traceries of the carefree dancing were beautiful beyond description.

The countryman loves the day's aftermath, that period of gloaming between day and darkness when the "pale stars blossom in the sky, and twilight's gloom has dimmed the bloom and blurred the butterfly." The nighthawk is partial to these

twilight intervals. Then he careens about above city rooftops or low above his favored meadows, shouting his nasal hunting song as he snaps up unwary insects.

The world of the June darkness is a mysterious, awesome sort of place, with grotesque shadows and fearsome blundering insects whizzing by. Few indeed are they who know what wonders this world of the dark holds within itself. There are whole armies of living things which begin to awaken after sunset.

When the June twilight fades the little red bat starts her "day." Her sleep is finished under the leaves of an obliging tree where she hung head downward, hidden from the sun, her wings folded till she looked like an old cocoon or a cluster of dead leaves. Now her eager ears bring her the whine of midges. She can see the wavering passage of moths and hear the bumbling flight of tasty June beetles.

Later this month the common evening primrose will bloom in the dusty roadside edgings and in enchanted fencerows and weedy old-fields. Like the night reveller it is, the evening primrose has a jaded, bedraggled appearance by day. But at sunset a bud begins to expand its delicate golden petals slowly and soon its fragrance becomes increasingly powerful. Soon come the hawk moths like meteors through the air to hover for an instant over each blossom, probing for the nectar hidden in tubes so deep and slender that none but the moths' long tongues can drain the last drop.

The street light on the corner is often a revealing factor to many of the wonders of the night life about us. The big water bug cannot resist the lure of this glowing siren and so introduces himself to many who never suspected his presence in the neighborhood. The gorgeous luna moth or the golden imperial moth may flutter in from woodland haunts

to join the whirling parade about the dazzling light. Even the dobson fly, fearsome looking parent of the hellgrammies of rocky stream beds, often leaves his wide valleys to follow the gleam.

As the month wears on toward July the big poisonous mushroom known as the Jack-O-Lantern begins to appear about old stumps or decaying wood. This fellow has a special chore to perform during the witching hours of night, for it is phosphorescent and glows eerily against the ground. By day it is a disagreeable looking saffron colored mushroom, forming large patches wherever it sets up housekeeping.

In more remote sections the big cat owl may still be heard as he hunts out his midnight snack of young rabbit, or perhaps even strong-flavored skunk. There will be a deep-toned, lonesome cry, echoing through the trees like the distant baying of a dog. Then suddenly the owl will swoop to the kill and his blood curdling scream of success shudders up and down the airways of the night.

The countryman finds endless fascination in the realm of the June darkness. He slowly learns the language of another world in the starry shade of dim and solitary loveliness. Patiently he tracks down each new sound in the night. An early evening stroll along the country roadsides becomes an adventure in enchantment. And the greening countryside is rapidly becoming a double feature attraction.

We rode through the southern reaches of the moraine country, that area of sand hillocks ground out and pushed ahead by the great ice pack some thousands of years ago. Cut banks by the roadside revealed all sorts of fascinating mementos of the roughshod journeyings of the grinding glaciers. Bits of granite, sparkling quartz and odd pieces of feldspar were mixed in with the shales and sandstones shards roughed out across

the years. Among the fragments were many of the flat "wafers" small boys love to skip across wide creek eddies.

The countryman is always stirred by the tremendous epic narrative laid down in the shales of the glacial moraine. Tumbled together in the sandy deposits are bits of the earth's rocky ribs from outcroppings hundreds of miles away. The mills of the ice gods had ground slowly and here was the grist, mute evidence of an ice age beyond the reach of man's imagination.

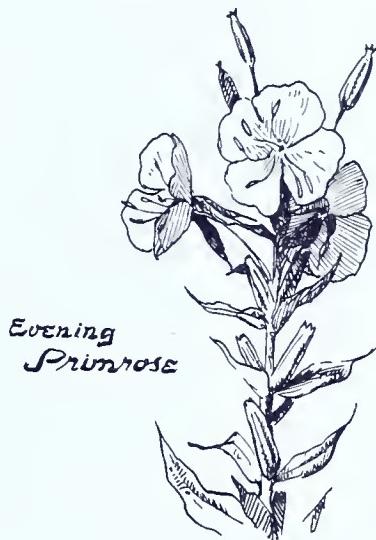
We passed an occasional sand "quarry" where big gasoline shovels had cut deep into the deposits, exposing sand cliffs which had treasured their quartz particles for centuries.

Bank swallows have found these exposed cliffs to their liking, particularly where the sand is of such consistency as to permit tunneling of the passageways and cavities they use as homes and for nesting sites. A large colony of these little sand martins had preempted one such cliff close by the roadside. The face of the sandy precipice was pock-marked by about 150 of the entrance holes, closely grouped.

We stopped and watched for some time the fluttering activity about the colony. The bank swallow is a little fellow, smaller than the English sparrow, but his long wings give him an appearance of greater size. This colony was apparently feeding young, and the continual bustle about the nests provided a most delightful outdoors interlude.

When you come across a sandy cliff that seems shot full of shell holes by heavy cannonading, stop and get acquainted with the bank swallow. He's a very worthy citizen and one of the most graceful masters of flight among our feathered neighbors.

A fledgling sparrow hawk moved in with us the other day and promptly became the storm center of one of the most memorable fuels to dis-



*Evening  
Primrose*

rupt the peace and quiet of our rural routine. He arrived in a cardboard box, and like every homeless waif who reaches our doorstep, was taken in with open arms by my unsuspecting wife. Advance billing had listed him as a baby "hen" hawk, but he turned out to be a sparrow hawk foundling, as cute as Christmas, and quite handy with his beak and those needle-point talons.

He had apparently fallen from the nest, and displayed a ravenous interest in a handful of ground beef as soon as he had been placed in a cage box on our screened-in back porch. For a day or two all went well. He was given the mundane name of Henry and he ate and slept and otherwise comforted himself as a mannerly young falcon should.

We promoted him from ground beef to raw beef trimmings and since then he likes nothing better than to mangle a gory chunk of this stuff, holding it down with one foot while performing murderous mayhem with his hooked beak. One night he discovered he could scramble out of his box. This gave him the run of the whole back porch and trouble started immediately.

Hawks love high places and Henry began to feel the urge to try those long falcon wings. He would raise them high above his back and run full tilt across the porch in a most comical performance. After a day or two of this he took to launching out in short flights. First he made it to the seat of a wicker chair. This was not high enough so he tried for the chair arm and soon mastered that ascent. The next step was up the wicker to the top of the chair back.

Here he was at a height which satisfied him for a day or two, until he espied the house plants on a shelf high in a corner of the porch. My wife had long since taken to veiled threats and mutterings about birds coming along and whitewashing her newly scrubbed porch furniture. Then one day she stepped out and there was Henry reposing splendidly in the middle of her prize begonia.

This called for drastic action. I will be a long time forgetting the tempestuous scene in which the young kestrel, protesting bitterly, was evicted from the begonia. He went on to greater heights and in another day had settled down for a cozy nap in the heart of a tremendous fern which occupies a stand at least seven feet off the floor.

My wife is now alternately breathing fire and calling us out to see the latest cute caper on the porch. Eventually we'll fling wide the door and watch the orphan sweep skyward where he belongs. In the meantime the screens are a mass of baby feather fuzz and the whole porch is a mess. But I'd like to see anyone try to hurt that pampered hawk while my wife is on hand.

The first weeks of June are a sort of "marking time" period on the wild flower front. Now the dense shade in the timberlands halts most of the floral activity on the forest floor. The tall meadow and roadside flowers of mid-Summer have not yet pushed far enough above the tangles to open their blooms to the sun and the bees.

Household cares also put a semi-silencer on the bird-song festival which ushered in the month. After morning reveille the harried feathered fathers are too busy hunting up lunch for the youngsters to give much time to singing. But they know that June is a special month, the high noon of the year, when "the world is full of roses and the roses full of dew, and the dew is full of heavenly love that drips for me and you."

. . . *The End*

### BEDFORD BANK GIVES USEFUL GIFT

A conservation-minded Bedford County Bank is observing its 80th anniversary in an unusual fashion.

The Directors of Hartley National Bank of Bedford have announced purchase of a Lowther Tree Planter for free public use in planting trees for reforestation and for Christmas tree crops.

Since more than half of Bedford County's 625,160 acres consists of forest land the project will be of special interest to many private landowners who have idle acres not fitted for agriculture. The project will be sponsored by Hartley Bank and various county agricultural agencies.

Searching for something that would prove of real and lasting benefit to many citizens and to Bedford County as a whole, the directors felt that the futherance of a tree planting program would meet a genuine need.

In making the announcement, the green-thumbed bankers reminded Bedford countians that trees produce a valuable crop, conserve moisture, stop erosion, provide food and cover for wildlife and add beauty to the countryside.

—Pennsylvania Forests & Waters



# *Living Under Canvas, And Liking It*

By Bill Wolf

ONE of the mysteries in current literature on the outdoors is the lack of attention paid to camping out. There is no lack of interest in the subject, because probably more persons spend some time each year under canvas now than at any time in the country's history (due principally to the millions who pitch tents in the various States' park campsites) and camping appeals to the high sense of adventure which modern man has not yet lost.

Even Army men, who felt that they hated the very sight of canvas after living under it through

trying circumstances, find voluntary camping the complete opposite of the restrictions that made their service tenting somewhat obnoxious. For instance, I never saw three persons enjoy a camping trip more than a trio of ex-servicemen who went with me recently.

It was all new to them. One had gone camping several times as a boy with the usual unpleasant results from unplanned camping. Another had been a Boy Scout when younger, but knew nothing of actual camping. The third had never lived in a tent except in the Army.

We drove to a wild and secluded section of a stream in southeastern Pennsylvania, and pitched two tents near it where a spring run came in to supply drinking water. Since we didn't have to carry anything far, we were able to take along more comforts than is possible on a trip where everything is packed in on the back; but, even so, we "roughed it." That is, the earth itself was our bed and our chairs, our table and our fireplace. The meals were cooked over a wood fire, and the utensils were scoured clean in the spring run. The fire at night was our chief source of light. Daylight and dark were our timepieces, since we had no watch along.

Not roughing it as our ancestors did, perhaps, but a far cry from the city, and a break in the humdrum routine of everyday life. They took to it like kids, and the essential boy that is in every man came out and showed in their enjoyment of the most ordinary things. They were city men who did not fish or hunt. Therefore, they found something new and interesting in each encounter with a groundhog, snake, turtle, frog, salamander, bird or just a noise in the night.

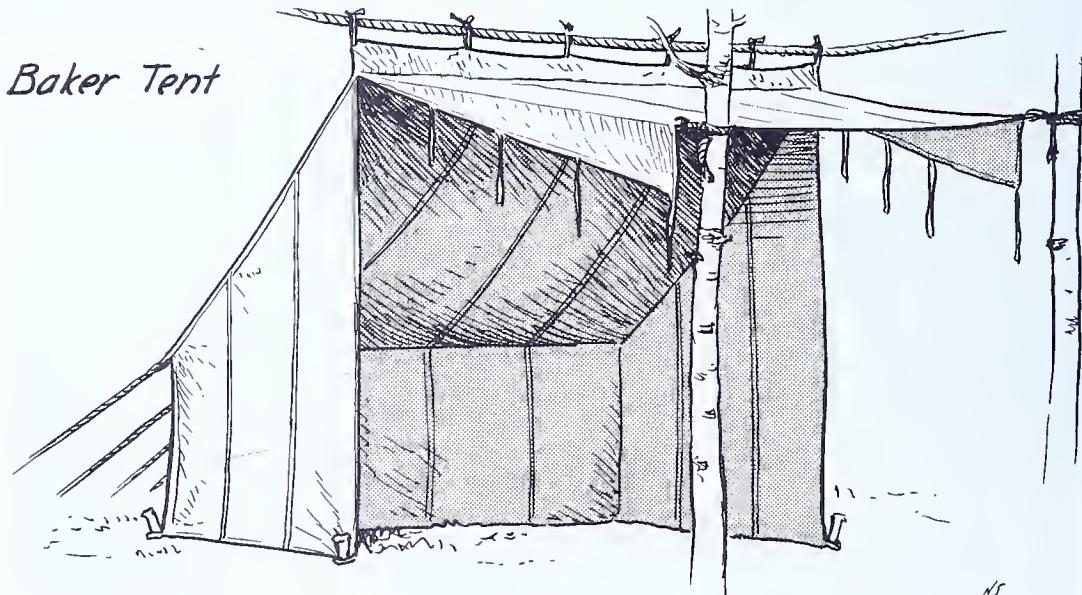
Their group reaction was that "this is entirely different. In the Army someone did all the thinking for us. We were told where to set up our tents, and then all we had to do was keep them clean. Here, we must get our own firewood, cook our own meals, do everything for ourselves."

This independence, and this freedom from the restrictions of house life and everyday work, are good reasons why every man should try some camping out. And this applies to the countryman, too. One of my best friends has lived all his life in the mountains and woods, but never slept out overnight by a campfire in all his forty-some years until he and I put packs on our backs and went miles into the woods two winters ago to set up camp. He was as excited as a boy in his early teens, and had a marvelous time because it was as new to him as to the city trio.

More men would go camping, I believe, if they knew how to go about getting started. Let's look into it.

There are all kinds of camping. Easiest is that done in State parks where you set up your tent on a site which often has a wood floor, piped

Baker Tent



water and other refinements such as food and ice delivered daily. This can hardly be considered camping as we mean it. Then there is tenting during the deer season. One of the phenomena of Pennsylvania deer hunting is the springing up of tents through the mountains. These usually are large wall tents, often erected over a previous prepared framework, and living in one is comfortable and convenient for hunters who like to be right on the spot.

Then there is what might be called "roadside tenting," wherein the equipment is taken from the car and set up near the road. With this sort of camping it is possible to take along cots, mattresses, gasoline stoves, canned foods and all the appurtenances of civilization. This is all right, but it can't be called true camping, either.

Finally, we have the form of camping under discussion here in which everything that the camper will need for his trip is put in a canoe, or on the back, and carried thus into the woods where there are no roads or stores. The pack must contain your shelter, bedding, clothes, food, and all the small things that go along. This is the closest we can come to living off the land today.

This is not intended to be a course in camping. There are lots of books that profess to teach camping, and it might be an idea to go over one, although I suspect many of them were written by armchair campers who have theories about living outdoors. The best we can do here is to discuss some absolute essentials on how to live outdoors in Penn's Woods and like it.

Reduction of weight and bulk to a minimum is the first consideration. Only so much bulk will go into even the largest packsack, and only so much weight can be carried. I have carried 80 pounds or more for short distances, but a pack weighing

half that is just about ideal for a grown man, and 25 pounds for a boy or woman. This does not allow for many luxuries, but neither does it mean you must go without comfort.

Get a big pack with wide shoulder straps. Guides up north prefer the Duluth type, which is somewhat like a rectangular box of canvas, roomy and strong. I like the kind sold as Army surplus, with a lightweight metal frame and webbing that fits the small of the back, and which was swiped as an idea from the Swiss Bergen rucksack. It has one huge pocket, three bellows pockets on the outside, one flap pocket.

If Duluth style, you will want something flat next to your back to prevent gouging by sharp objects inside. One of the strong wire shelves from inside a gas stove oven just fits such a pack, and makes a perfect grate on which to cook.

There are some things that I keep permanently in my packsack so they are ready for each trip, and won't be forgotten. They are: Four blanket pins, a dozen nails of various sizes, a supply of matches which are either waterproofed or in a waterproof container, enough salt and pepper for at least a week, a pair of white cotton work gloves (for handling hot cooking utensils), a hank of light, strong rope. Practically no weight or bulk, but great comforters to have along and so easily forgotten.

Food is the greatest problem for the beginner. He doesn't know how many or how much of this or that to take. It needn't be a problem. If two men are going, they can sit down and plan the entire menu in advance, noting quantities as they go along. Say they want bacon and eggs for breakfast the first morning. Then put down eggs (2 per person), bacon (one-half pound for two), bread (2 slices each), butter, salt, pepper. Breakfast the second morning might consist of eggs scrambled with dried beef. So, under eggs they

add two more each, put down dried beef (one-quarter or one-half pound), add more bread to the number of slices, and so on. Luncheons are planned the same way, and so are dinners. Then the totals are added up and purchased.

Coffee and tea are personal choices, and I take coffee (two pounds is about right for two persons for a week), but tea is much lighter to carry, is just as stimulating.

Now, then, let's consider foods briefly. Canned goods are out, with a few exceptions. Canned vegetables, soups, etcetera, contain water or other liquids, and there is no sense in carrying water when it usually is everywhere around you when camping. Buy dehydrated noodle soups (and take along an extra pack of noodles to thicken them to mansized soups), vegetable soups for lunch, to eat with sandwiches.

Dehydrated onion flakes are a very satisfactory substitute for heavy raw onions. Take celery flakes and parsley flakes, dehydrated, for flavoring. Dehydrated potatoes are all right if you don't mind a steady diet of what can be cooked with what amounts to mashed potatoes for every meal. I'd rather carry some raw potatoes. Macaroni, rice, dried lima and navy beans are good lightweight substitutes for potatoes. Plan meals to include them.

Bread is all right for a short trip, no good for a long one. If you carry bread, squeeze a loaf together without breaking the wax paper until all the air is forced out (this reduces bulk), then pull it back to something resembling normal shape when ready for use—or buy one of those chunky, solid loaves sold in foreign sections. On a long trip, prepare a biscuit mix at home and carry it in a *waterproof* bag. The same flour can be used for dredging fish or meat before frying.

Eggs can be broken into a tin or jar and carried thus. Carry butter

the same way. How to take meat is always a problem. Fresh meat won't last more than a day or two in moderately warm weather. It's all right for the first day. After that, you must depend upon heavily smoked meats or salt-cured meats (smoked sausage, ham, bacon, dried beef) or on tinned meats, or cheese.

Tinned meats are the best solution for any long trip. Canned corned beef, roast beef, spam and so on are excellent, and tin adds little additional weight and keeps the meat perfectly. A fine stew can be made from can or two of corned beef or roast beef, plus potatoes, onion flakes, mixed dehydrated vegetables, parsley and celery flakes.

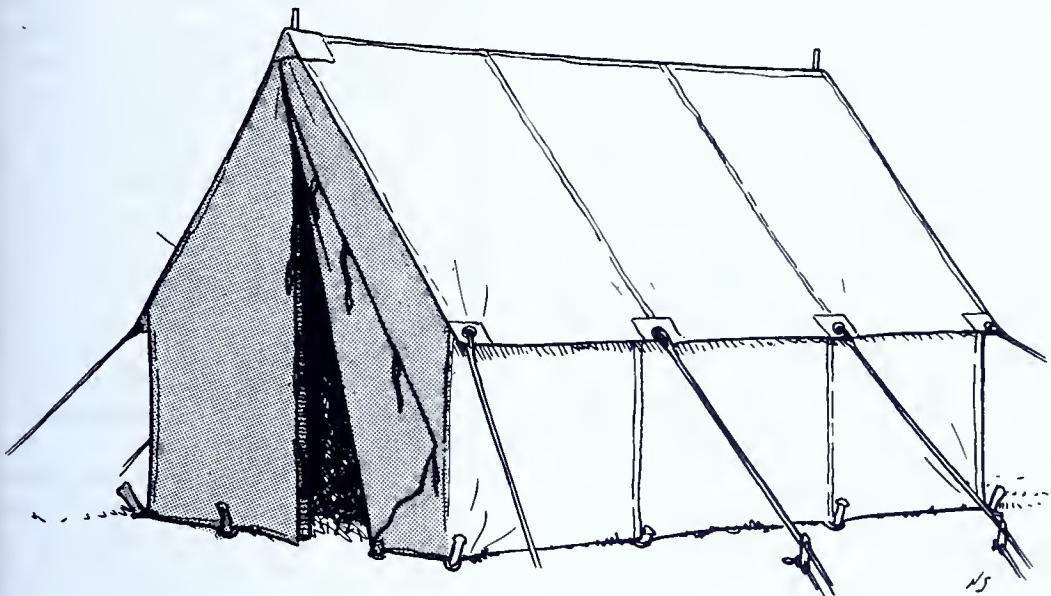
Cheese is a fine protein food. We sometimes melt it with bacon in the morning for breakfast, have it in sandwiches with our soup at lunch, make cheese macaroni for dinner. There is no waste and no surplus weight to cheese, unless you buy it foolishly in glass jars.

If on a very short trip, carry evaporated milk in tins; but if gone for more than a day or two, use dried milk which is sold in drug-stores under trade names like Klim. Like it or not, this is the only way you can have milk along, and it is useful. For instance, I make cheese macaroni by boiling the macaroni in water, straining off the water, adding milk to cover, and then cutting into it pieces of cheese, cooking until the cheese melts.

You can't forget anything. If you expect to fry potatoes, you will need grease, and you must decide in advance whether you can save enough fat from fried bacon to fry the potatoes, or whether you should carry along a can of Crisco or Spry. If you plan some dried apricots, prunes or peaches for dessert, don't forget the sugar.

Best way to practice for a trip, or to try out new ideas in cooking, is at home. Plan a meal using

## Wall Tent



only those things which you will employ in camp—dried onion flakes, parsley and celery flakes, dried lima beans, dehydrated soups, etc.—and cook it in the utensils you will take camping. Make notes on what is used in the line of salt, pepper, butter, seasonings.

The utensils are important, too. Unless very finicky, a large and sharp pocketknife is perfect for cooking, cutting meat, buttering bread, stirring things, cutting bait and whittling, but each person also needs a large spoon and a fork. There should be one light metal pie tin as a plate for each person, and one cup (get enamelware ones with open handles because they nest together, won't burn the hands or lips).

Also essential are: One frying pan of light material, two sauce pans, one large and one small, plus light tin lids to cover these several things; one coffee pot. Pack food in these so space isn't wasted. I also take along one Army mess kit as an auxiliary frying pan, warming pan,

soup dish and biscuit baker. The mess kit which has one-half of it divided into two sections is perfect for baking biscuits. We work up the dough, roll it out, divide it into two portions, put them in the greased half of the mess kit, "fry" them slightly on top the fire to cook the bottom, then prop them at an angle beside glowing coals to cook through and brown lightly on top.

Upon arrival in camp, put any perishables at once in the coldest water available, sinking the watertight jars containing butter and eggs, and putting the other stuff on stones barely raised above the water surface. Cover all with leafy branches which should be dampened.

There is no perfect single kind of tent for all sorts of camping. If your object is cutting down weight as far as possible, then you want something just large enough to crawl into and be covered at night, which is what the pup tent made of shelter halves consists of. Considerably lighter and somewhat larger is the

Army "mountain tent" which is being sold as surplus, especially if you remodel the front and eliminate the crawl-in tube. This tent is made of good light material and the one I have is just now showing signs of wear after five years of hard service.

However, it is impossible to be comfortable in such a tent in bad weather. You can't sit or stand up in them. If you want a *lightweight* tent in which you can do both, as well as sleep, the forester style is indicated; but you will pay a nice price for one. This tent has a high front, which slopes sharply to the rear.

The warmest tents in cold weather are those completely open at front which face a fire, or those which can be closed entirely and have a heating apparatus inside. The small mountain tent can be kept quite warm with two plumber's candles burning inside it, believe it or not, since it is nearly airtight. But for really cold weather, I'll take a piece of tent cloth erected like a lean-to, build a fire in front of it and have it reflect the heat down on me.

You can carry a blanket if you wish, or better, a sleeping bag. The sleeping bag is good even in warm weather, if made of down or part down and part feathers because it

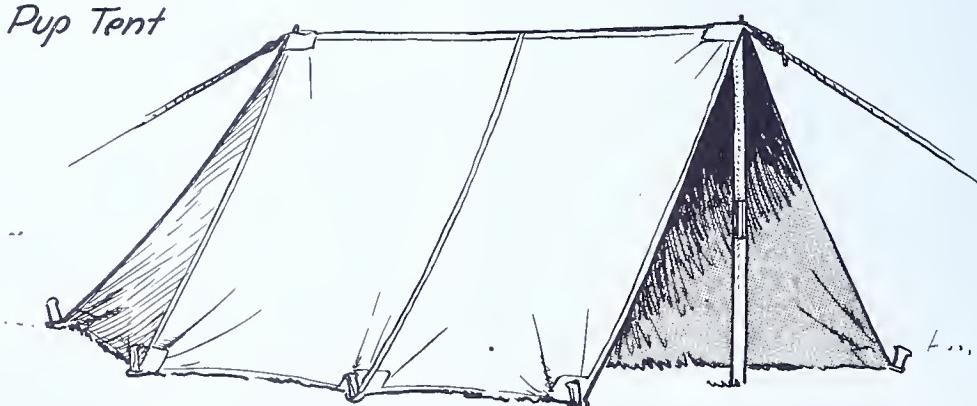
gives padding and insulation on the ground, is light in weight, compresses to small bulk. If using a blanket, make sure it is all wool and fluffy (cotton absorbs moisture in the woods and mountains, always feels wet and clammy). A "hard" blanket like the Army's wears well, but isn't as warm as the fluffier kinds.

Pick your clothing with an eye to warm days, and cold nights, to sun and to rain. Include one woolen shirt, wear woolen socks only, wear walking shoes that cover the ankle, but don't wear the real high-tops. And, somewhere in your pack, include needles, thread and buttons. The squatting done in a camp splits pants across the knees if old cloth.

There are a lot of fallacies about camping, and I suspect they have been spread by those authors mentioned before who have heard something and stated it as gospel truth without putting the ideas to the test.

One of these is that you can keep warmer around a small fire than about a big one, and that a bed of hot coals is ideal for all cooking. Neither is true. If it's cold, build a big fire instead of huddling over a tiny one. A bed of hot coals is good for slow cooking in camp, but I prefer a good bright flame right up

*Pup Tent*



Ned Smith

against the pot or pan for quick frying or bringing anything to a boil.

Another fallacy, and an abomination, is the thing called a "camp axe." This short-handled thing is a worthless affair, good only for trimming twigs and driving in tent stakes. Twigs can be broken by hand, tent stakes can be driven in with a rock. Get an axe with a 24- or 27-inch handle, with a light head but still big enough to cut fair-sized logs. L. L. Bean, Freeport, Me., sells a good one which he calls a Modified Hudson's Bay Cruiser Axe. Strap it on the side of your pack. I'd rather be without a knife in camp than such an axe, although little actual wood chopping is done for the fire.

We are too lazy, perhaps, to cut much wood. The first inclination of the novice camper is to grab an axe and start slashing into wood. This wastes energy and is needless. Nearly all wood for cooking can be broken by hand, and as for big sticks for the night fire, we just lay one end in the blaze and keep shoving them up as they burn, thus eliminating most chopping.

No fallen wood which has been on the ground more than a day or so is worth bringing to the campfire. It gets damp and soggy. Any standing dead wood (that is, trees, dead branches on live trees, raised branches on fallen trees) are dry if reasonably sound. They will stay dry inside through days of soaking rain. Break them open and the good dry heart-wood will burn readily.

One of my camping companions started in as a greenhorn a decade ago, and faithfully brought back green wood at great expense of labor, until he learned the difference between dry and dead wood. It's hard to believe, but a lot of persons can't tell one from the other, when the leaves are down.

The evergreens, if dead, provide

fast-burning wood that will give a quick flame when starting the fire; but they are no good for cooking because the pitch in them soils the utensils. In a rainy spell, though, go to the evergreens and break off the tiny twigs near the trunk. They are as good as matches in starting a fire. For good, steady heat, get dead maple, oak or some similar solid wood. When a big night fire is going good, some green woods will burn in it, and it will dry out wet dead wood and burn it.

A cake of soap, and one of those light metal sponges will clean most of the grime from fire-stained pans, although I see no harm in letting them retain their nice patina of smoke and soot, and use the soap and metal sponge only on the inside.

Frankly, I don't think any hunter or outdoorsman can understand and appreciate the woods and mountains until he has lived with them in a tent. There is a world of difference between being a daytime visitor only, and being there when night falls, when night comes down close around the tent, and when daylight chases the darkness.

The night is full of strange sounds. My trio of former servicemen were fascinated and puzzled by what they heard. There was a tree somewhere in the distance on which two limbs, or a split trunk, rubbed and mooed vaguely like some animal. There was a night bird which answered one of the camper's replying whistles. There are the squeaking bats overhead, the chorus of frogs and tree toads, the stars that seem twice as bright when you step back from the camp fire. There is the campfire itself, into which you can peer until hypnotized into drowsiness, whereupon you get up, say good night and settle down under wraps to sleep until morning comes.

. . . *The End*

# Youth and Conservation

*Each year the Pennsylvania Game Commission contributes \$250 to be used as prize money in the Pennsylvania Forensic and Music League's annual contests. The results of the conservation poster, essay, oration and photo competitions are given in the following article.*

THE 1952 State final contests for the Pennsylvania Forensic and Music League, sponsored by the University Extension Division of the University of Pittsburgh, were held in Harrisburg, April 24-26 at William Penn High School. The host for these state finals was the Harrisburg Board of School Directors. It is estimated that there were 6200 high school boys and girls in Harrisburg for these events.

The Game Commission contributes \$250 to the Forensic League for conservation education and it is spent for prizes in each of the various wildlife conservation events as follows:

- 1st prize—\$50 Savings Bond
- 2nd prize—\$25 Savings Bond
- 3rd prize—\$10 Savings Stamps

Mr. Leo A. Luttringer was scheduled to be one of the judges in these various wildlife conservation events, but because of illness was unable to participate. Wilbur M. Cramer, who substituted for Mr. Luttringer, and Mrs. Virginia Bear of Camp Curtin Junior High School of Harrisburg were the judges in the essay contest conducted Thursday forenoon, April 24. The winners out of 8 entries were as follows:

1st—J. Kenneth Craig, Mt. Jackson High School

2nd—Howard Zeitlin, William Penn High School

3rd—Guido J. Casari, St. Vincent's Preparatory School

Mr. Cramer and Mrs. Verna B. Hicks of the Harrisburg School District were the judges in the poster

and photographic contests, Thursday forenoon, April 24. A total of 15 posters were submitted and the winners were as follows:

1st—Jean Horton, Uniontown High School

2nd—Yvonne Zelnis, California High School

3rd—Alison Rauch, William Penn High School

Only two photographs were entered. They were rated as follows:

1st—Sam Phillips, Mt. Jackson High School

2nd—Mike Wycinsky, German Township High School

Mr. Buell Whitehill of the University of Pittsburgh and Mr. Cramer were the judges in the Original Wildlife Conservation Oration test at the William Penn High School on Thursday evening, April 24. There were four speakers and they were rated as follows:

1st—Raymond Jones, New Castle High School, subject "What Wildlife Conservation Means to My Community."

2nd—John Hetherington, Bentleyville High School, subject "The \$64 Word in Wildlife Conservation."

3rd—Stephen Pitkin, William Penn High School, subject "The Truth About Birds of Prey."

4th—Barbara Shaffer, East Stroudsburg High School, subject "King of the Forest."

Text of the prize winning oration and essay, and reproductions of the 1st prize photo and poster appear on the following pages.

# PRESERVE...



Above is shown a black and white reproduction of the prize winning poster by Jean Horton, pupil of Uniontown High School.

# What Wildlife Conservation Means to My Community

By Ray Jones

THE first white men who set foot upon the soil of what is today the Commonwealth of Pennsylvania found a land of seemingly inexhaustible fertility. They found great expanses of woods, literally teeming with an amazing variety of wild animals. Nowhere else had these white men or any other white men witnessed such an abundance of wildlife. This land, later to be christened, "Penn's Woods," was as beautiful and as bountiful as any that ever existed on the face of the earth.

But it was not to stay this way for long. For years the Indians had lived here and used the animals for food and clothing but they had not wasted them. But these white men who came, quickly changed the scene. Immediately, they turned this abundance into ready cash and as a result the animals quickly disappeared through their carelessness and wastefulness. Only the furs were used and the rest of the animal was thrown away. In fact, if the beaver skin hats had not gone out of style in the 1800's the beaver would now be extinct. Not only the beaver but otter, martin, mink, muskrat and many other fur bearing animals were used so extensively that today they would all be extinct if game laws had not been made to protect them.

The dawn of the present century found us at the conservation crossroads. It became a question of whether or not we were going to lose the last remnants of Nature's wild animals, which were quickly passing through our fingers.



What really is wildlife conservation? The average person, yes, even the experienced outdoorsman balks at the word, especially if he doesn't understand the full meaning or implication of it. Everyone feels that they are practicing true wildlife conservation, but they really aren't. In reality this type of conservation is the wise use and management of our wildlife.

The real reason why wildlife conservation has not been such a success is because the bulk of the population believes that it is some mysterious technology, affecting and concerning sportsmen alone. Also we, as a people, cannot wholeheartedly support anything unless we are absolutely sold on the soundness of the whole undertaking.

I like to think of my community as comprising, not just Lawrence County but our state as a whole. We in Pennsylvania are living in Nature's wonderland and the only way we can keep it that way is by its citizens concentrating on a full speed ahead conservation program.

There are many wildlife problems confronting our community at the present time but perhaps the most important one is finding adequate food and shelter for the birds and

animals. This is bad enough in the summer but in winter, it becomes more than ever important.

We know now definitely what kinds of foods birds and animals eat. At the beginning of the present century, our knowledge of this was scanty and no one could speak with authority. But now that this, the biggest step ahead in wildlife conservation has been learned, we have gone ahead much further. Sportsmen's clubs which sprung up were the first to start wildlife conservation out of a study of what foods they eat.

Farmers in our community and all over the country were shown how to manage their woodlots so that there was always a succession of useful trees that would be used for cavity nesters such as raccoons and squirrels.

Some of the fruit bearing shrubs were left uncut in woodlands to furnish food for the wildlife. Among such shrubs were wild rose, dogwood, thorn apple, grape vines, elderberry, blackberries and countless others. This helped immensely. Where no natural fence rows were provided, farmers were shown how to plant hedge rows of multiflora rose. They provided impenetrable barriers against livestock, furnished ideal cover for wildlife and a colorful border the whole year round. With their beautiful blooms in the spring and summer plus the bright red berries in the fall, these vigorous plants furnished a living fence row and an excellent food and cover supply for wildlife. Some farmers even planted clumps of shrubs, showing that they were interested.

All these things have been done in the past and are still being done to the fullest extent. Since they were started, great progress has emerged in the wildlife conservation program.

Right now in Lawrence County, the Game Commission and the Department of Public Instruction

joined by the F. F. A., the Future Farmers of America, are carrying on a wildlife aid on a county basis sponsored by the Sportsmen's Clubs. This program offers a low cost means of returning natural habitat for wildlife under a definite long range plan. Briefly, the program will function around these aims: woodlot management which entails fencing wildlife areas with wire fence or living fence of multiflora rose as well as thinning and cover planting within the actual woodlot. Wildlife in the harvest plan encourages either the separate planting of food plots or leaving strips of standing grain. The winter feeding requires erection and maintenance of shelters from early fall till late spring. Also in the program is making nesting boxes and the pond management encourages construction of small ponds for both fish and aquatic animals such as furbearers and wild water fowl.

Then the animals need solid foods, especially in the winter to provide a high body temperature. Patches of various cereal grains will be planted and arrangements with farmers to leave patches standing will be made. These cereal grains provide the high body temperature necessary for survival in cold weather.

We need Nature, just as it needs us. For instance, I read of a woman once, bereaved, crippled, on the verge of losing her reason, who was brooding on her misfortunes when a chickadee alighted at her window which overlooked a woodlot. She gave him crumbs and he gave her hope. The sill became an unofficial station, where birds were fed, banded and recorded. Today, that woodlot is a bird sanctuary, administered by trustees, its floral and feathered beauty preserved for posterity.

You need not be a sentimentalist to appreciate wildlife. Besides making our outdoors more beautiful and more interesting, wildlife plays a part in the survival of man. Penn-

sylvania contains more than 15,000,000 acres of forest and more than 3,000,000 acres of that woodland are owned by the public and are devoted to wildlife, flood control and recreation.

Every year from its woodlands, 850,000 hunters bring home from its forests, small game by the millions. This game provides not only recreation for the hunter but also a means of getting meat for human consumption.

Think of a community without wildlife. The monotony would be so unbearable that no one would be even the least bit contented. Yet everyone takes it for granted.

To preserve this great paradise Nature has provided for us, each person must do his part. We must increase the size and number of game

and wildlife refuges in appropriate locations on both public and private lands.

Summarily, conservation is a way of life, a way of living that a person acquires both through teaching and practice. We practice conservation every day by observing the Golden Rule, and conserving your health. Let us stretch it a little farther to reach wildlife..

These principles must be imbued into the very being of every child from the time he is able to learn. Adults, too, must be reached by need and simplicity of wildlife conservation.

Then and only then will Penn's Woods continue to be a wildlife paradise, a hunter's paradise and a heaven here on earth.

. . . The End.

## *For Game's Sake Conservation*

By J. Kenneth Craig

LAST week I noticed my neighbor, Mr. Royster, cleaning out a fence row that had been there many years, perhaps since the Indians traveled through this territory. As I watched him I thought of the birds, pheasants, quail that wouldn't have a nesting ground next spring. I thought of the rabbits without cover in which to burrow and the squirrels without their food supply of nuts. One may say just a problem of fifteen pheasants, a small covey of quail, a few rabbits, and squirrels. Ah, but this problem, conservation of wildlife, is a national problem.

There is today in the United States a very wide interest in the conservation of wildlife. This is well illus-



trated by the attention the public shows in proposed legislative enactments for game protection, in the propagation of various game birds, and in the constantly increasing financial support given to the National Association of Audubon Societies, and the many state and local game protection clubs throughout the country.

Just why should we actively support and endeavor to preserve and replenish the small game supply of our land?

Let us claim three definite rewards: aesthetic, recreational, and economic.

If we were to lay this problem of wildlife conservation before the poets, they would remind us that "beauty is its own excuse for being." Else why would milady attach fine feathers to an otherwise fine headress! Certainly if it be the attractive attire of the male, or the more subdued plumage of his mate, there is real variety of beauty in the plumage of birds. To most people the principal reward from game management will be the pleasure of having a variety of living things about and watching their activity. Such associations are a part of man's attachment to the soil and are well worth preserving for their own sake.

A fellow who enjoys dressing up in a khaki suit blotched with red, taking a clean, oiled gun, and following a nervous black and white bird or rabbit dog over the brightly colored autumn landscape will realize the recreational value of game conservation. Every year thousands of hunters tramp over the brown grassy fields and woodlots in search of pheasants and rabbits. Men who have been tied to office jobs and to tramping city streets are back again enjoying the freedom of the country.

As always everyone is economy conscious. The animals and birds will pay their rent by collecting insects and providing hunting pleasure and meat for the table.

The diet of many birds is composed largely of insects and weed seed, thus becoming man's friend and helper. The value of furs taken from fur bearing animals in Pennsylvania each year averages more than one million dollars.

It is evident that if we are to enjoy the aesthetic, recreational, and

economic values of wildlife, the hunters must leave enough game for breeding stock. I have seen twenty men screen across a field taking everything as they went. One can't have game the next year if everything is taken. Another thing, the hunters should be careful with fire in woodlands. One match can destroy acres of wildlife refuge not to mention the small birds and animals that perish during the fire. Not only should hunters practice the rules of conservation, but they should also contribute time and money toward game replenishment and lastly they should do everything in their power to further education of conservation.

Now let me outline some conservation measures which farmers should practice.

First, let them keep those dogs and cats in the barn or corncrib at night. There is no doubt that dogs and cats are valuable to the community, but if uncontrolled they may become one of the worst menaces to wildlife.

Second, they should develop fence row refuges. Living fences are good where they are practical. Multiflora rose seems destined to replace the discredited osage orange hedges. In winter pheasants, quail, and rabbits will take shelter under the thorny tangle and feed on the red fruit.

Third, let them fence out raw gullies and eroded areas. Plant trees or shrubs in open gullies. This will provide shelter for small game and prevent further erosion. At the same time, it will add beauty to the landscape and increase the lumber supply in the future.

Fourth, fields should not be burned. This practice destroys vegetation which would have furnished food for small game as well as added humus to the soil. Burning also destroys the cover for wildlife as well as their young.

Fifth, let them keep livestock out of woodlands. Livestock will eat and trample underbrush, leaving little or

no cover for small game. Where there are cattle, there is no reforestation, no future cover.

Sixth, let them conserve the soil. Many farmers who fertilize, lime, and manure pastures for a good crop of grass seldom stop to think that this same crop of grass provides good food and cover for wildlife. So by keeping on with the conservation practices they will reap a double benefit.

Seventh, let them construct ponds. Many migrating birds will stop to rest and feed. They will not only be furnishing food for animals such as raccoons, but also have a supply of water for fire protection too.

Eighth and last, let them preserve den trees. When harvesting timber, they should save old trees and pile slash for wildlife cover. When cut-

ting an old tree, it should not be burned, but saved for homes for owls, birds, and squirrels.

And so if we are to have the aesthetic, recreational, and economic values of conservation the hunters must take just their share of game, be careful with fire, and contribute time and money to further conservation. The farmers must keep their dogs and cats at home, develop fence row refuges, fence out raw gullies, not burn fields, keep livestock out of woodland, conserve the soil, construct ponds, and preserve den trees.

Let us make these practices a habit. Then we shall gain continuing benefits and pass on to our children and grandchildren beauty, recreation, and profit from a bountiful supply of wildlife.

. . . *The End.*



*This hawk portrait won first prize for Sam Phillips, of Mt. Jackson High School.*

# Montour County

## Our Smallest County

Fourteenth in a Series

*Note: This center sheet can be removed without damaging the magazine by loosening the two center staples.*

### Land Area

The county contains 83,648 acres, of which 23,246 acres are forested. There are 71,607 acres in farms. Publicly owned land comprises 230 acres, of which 227 are State owned.

### Topography

The southern edge of the county consists chiefly of wooded hills. Farther north rich farming land predominates.

The county is drained by Chillisquaque, Mahoning, and White Hall creeks, Sechler run and the North Branch of the Susquehanna River.

### Transportation

Railroad transportation is furnished by the Delaware, Lackawanna & Western, the Reading and the Pennsylvania Railroads. U. S. Route 11, following the general course of the river, is the principal highway in the county, which has 132 miles of improved State highway.

### Fish Warden

Charles Litwhiler, Numidia.

### Agriculture

Montour's farm products equal in value its manufactured goods. Principal agricultural products include general farming, hay and grain.

### Industry

Principal industrial products are: iron and steel bars, women's and children's clothing, machinery and parts,

crushed stone and sand. Anthracite is reclaimed by dredging the river and a limited amount of lime is burned in the county.

### Historic

Situated as it is in the Susquehanna Valley, Montour County was once traversed by Indians travelling through this part of the state. Following in their footsteps came explorers, missionaries and traders.

The county's earliest settlements were made during the Revolutionary War, but were later abandoned because of Indian trouble. Colonel Daniel Montgomery, who later became a general, purchased land from John Lukens, Surveyor General for the Penns, and erected a cabin for his family in 1776. In the midst of the Revolution they were forced to flee because of the outbreak at Wyoming. The Montgomery's finally returned and built a fine stone house which now houses the Montour County Historical Society. The subsequent settlement was named Danville in honor of its founder. General Montgomery was an exceptionally public spirited citizen and was instrumental in improving education and industry in the county.

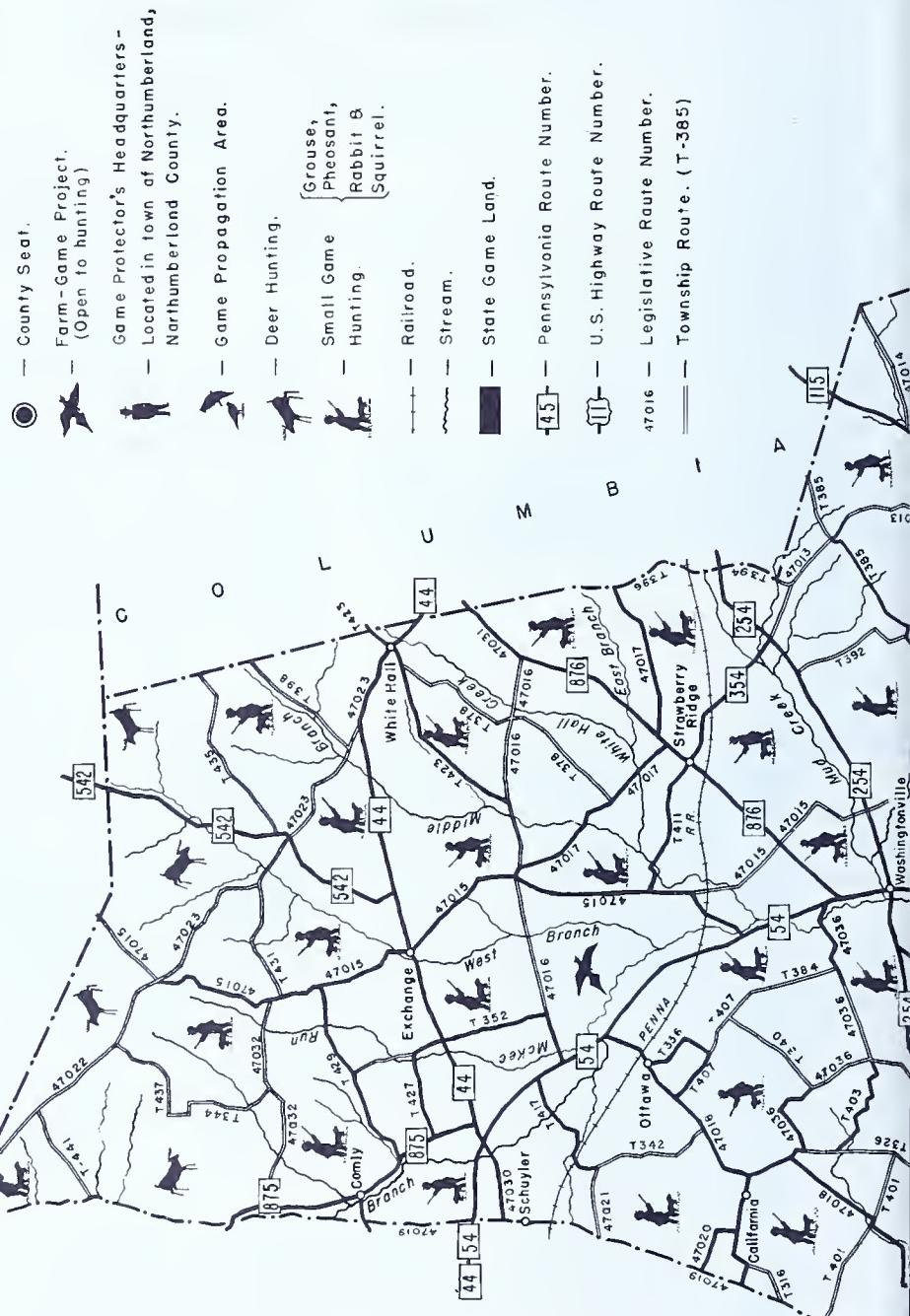
The inventor of the typewriter, Christopher Sholes, was born in Mooresburg in 1819.

Shortly following the invention of a process for using anthracite to smelt iron ore, Montour County became an important center of the iron industry. The Montour Iron Works was established at that time, and rolling mills were added in 1844. In 1845 the first iron "T" type railroad rails were rolled in the county's mills.

The county was formed from a part of Columbia County in 1850,

L Y C O M I N G C O U N T Y

...KEY...

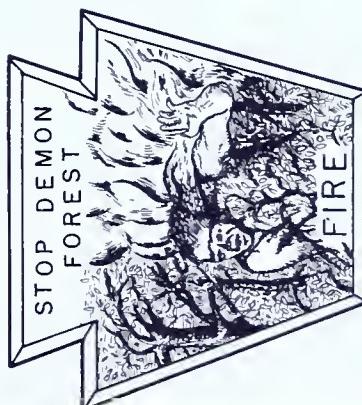


A M - 1952

MONTOUR  
COUNTY

PENNSYLVANIA

Scale in miles



following a bitter dispute between Bloomsburg and Danville to become the county seat. Both were equally important in trade and industry, and the division of Columbia County was the outcome.

The county was named for Madame Montour, famous Indian interpreter.

#### Recreation—Hunting

Other than a fair amount of deer hunting in the wooded hills of the southern portions, Montour county's hunting is chiefly of the small game variety. Ringneck pheasants furnish

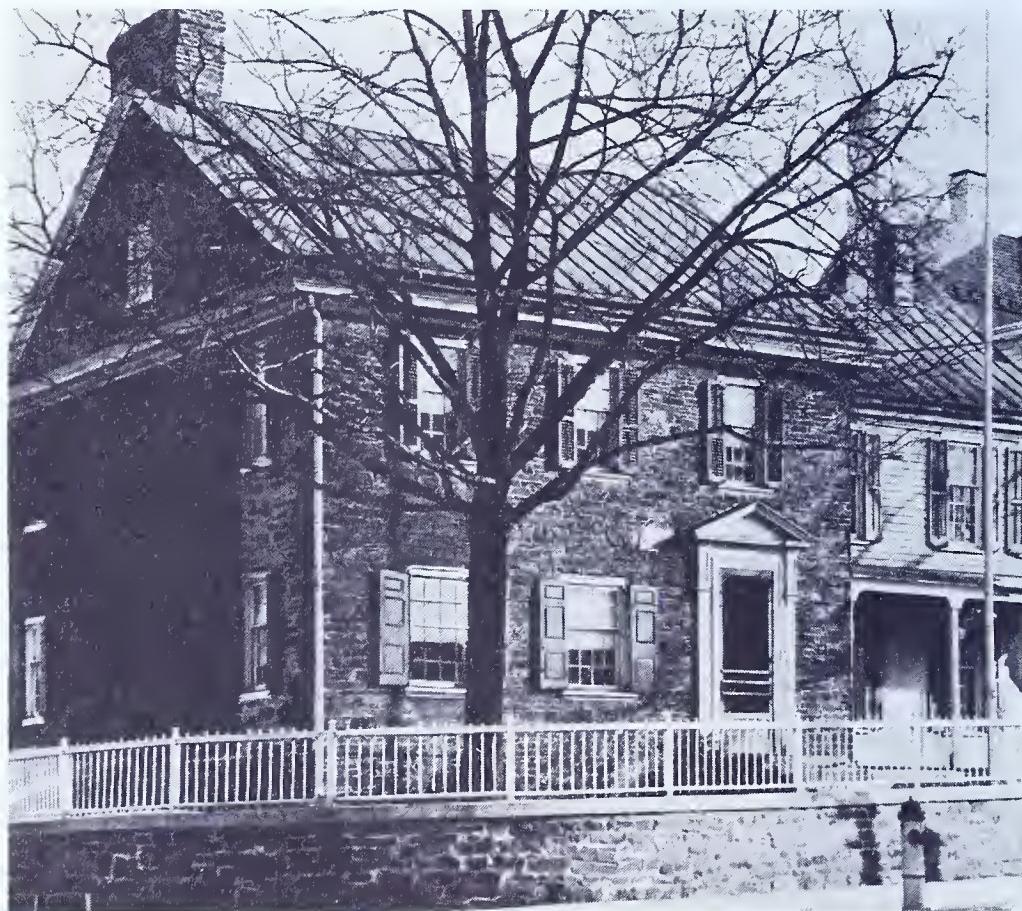
the best small game hunting, by far. At one time the county had a comparatively large Hungarian partridge population, now these have dwindled to a few scattered flocks.

State Game Lands in the county are represented only by a portion of Number 115, comprising 228 acres.

#### Recreation—Fishing

Other than the North Branch of the Susquehanna River the only other fishable waters in the county are those of the Chillasquaque Creek near Washington, Rt. 54, 15 miles of stream, stocked with black bass.

. . . *The End.*



Penna. Dept. Commerce Photo.

*Former home of Daniel Montgomery, founder of Danville, now houses relics of area's history.*



# *Trebور Duchess Wins Open Pennsylvania Grouse Championship*

By Marc J. De Berti

**P**OSSESSING the running grace of a gazelle and the heart of a lion, Trebor Duchess, good-looking setter female owned by Leonard Sasso, Pittsburgh, Pa., and handled by Dewey Duffie, Ridgway, Pa., won her second grouse championship in less than a year. In winning the Open Pennsylvania Championship Duchess or "Whitey" as she is affectionately

called around the kennel, had to defeat an impressive gathering of grouse dog greats originating from the rocky shores of Maine to the pine clad flats of Michigan. As usual the 1952 running of the championship was conducted over the celebrated Buzzard Swamp Permanent Courses situated only a few minutes drive from Marienville, Pa.

To win one grouse championship is often a lifetime feat in itself, and to capture two in such a short time is generally an accomplishment for the immortals. In the first place, to be eligible to even run in this event a dog must have previously placed in a recognized Open All Age Stake. Furthermore, the length of the heats are of two hours' duration and to stand up under this terrific pace a dog must be in superb physical condition. Since it is considered an endurance test stamina is naturally stressed, but it also calls for a performance of the highest order. Any dog capable of winning this title must be able to rise to the heights—must be extraordinary in all departments with perfect game handling ability.

On this day Duchess rose to these heights, for her ground coverage was flashy, she maintained her pace throughout the entire two hours and finished as strong as she started. In addition her manner of pointing birds—her arresting style with all the finish that anyone could desire commanded the highest admiration. So cleancut was her victory that no other dog was named "Runner Up" in this important titular event.

On this bright March day Duchess criss-crossed courses number 4 and 5 for two full hours in spite of a warm sun that beat the heart out of those with less determination. She ran wide and dug deep searching for the wily grouse. Four times during this grueling two hour pace Duchess made contact with game. On two occasions she was found after an extensive search lasting over 10 minutes on point with birds pinned right under her nose. On two other occasions Duchess found birds within sighting distance of the excited and thrilled gallery. Each and every point was perfect and not one mistake was charged against the brilliantly performing setter.

There were other great dogs that made determined bids and favorable impressions on the judges by their hard running and hunting ability. However, they all fell short of equaling the amount and quality of the winners work on game. For instance, the large gallery was thrilled by the searching race of the courageous but dainty pointer female, mistress pretty-bones, who incidentally was named runner up to the 1951 Champion Skyrocket Pride's Hank. The five time champion, Sam L's Skyhigh, was also impressive during his two hour grind and had he connected with birds the story might have been different. Another setter female Puckety Mask left a favorable impression, as did last year's champion, Skyrocket Pride's Hank. But failure to find sufficient grouse kept them out of the winner's column.

Grouse trials are offering to lovers of good grouse dog an outlet for their favorite kind of recreation. Since our usual grouse hunting season is only two weeks in length, many grouse dog owners have discontinued the breeding and training of these fine dogs, feeling that the hunting season is too short to make it worthwhile. Grouse trials so nearly simulate natural hunting conditions that the only act missing is the actual killing of the bird. In fact very few lovers of good grouse dogs care much about the actual killing of this grand game bird anymore. Therefore it is quite likely that such trials may again stimulate the interest and breeding program so prevalent among the rank and file hunter of a few years ago.

In the meantime those rare canines, the top-flight grouse dogs, continue to demonstrate that Pennsylvania remains the leading state when it comes to breeding, raising, and producing the greatest of them all—A Grouse Dog Champion.

. . . *The End.*



## *Outdoor Kids*

By Hal H. Harrison

HAVE you ever tried to pull an earthworm from its burrow? If not, have you ever watched a robin tugging and pulling to get one free of its underground tunnel?

Well, Billy and Jane will tell you that it is a much harder job than you may think.

The children hunt earthworms with a flashlight after dark, when they come to the surface. A can of earthworms gathered tonight means plenty of bait for fishing tomorrow. But you must be very quiet and quick to grab a worm, and even after you have one end between your fingers, the other end holds on for dear life.

At first glance, an earthworm seems smooth and naked and very helpless. But it isn't smooth. There are eight hooklike bristles on each of the one hundred and twenty rings or segments which make up the body, and when the earthworm grabs the sides of its burrow with these bristles and then uses its strong muscles, it is easy to see why its grip upon the soil is so strong. The bristles are not just for holding on, either. They are the means by which the earthworm moves.

Charles Darwin, who said that in England there are more than fifty thousand earthworms per acre of garden soil, also declared: "It may be doubted

if there are any other animals which have played such an important part in the history of the world as these lowly organized creatures."

For earthworms are the finest soil cultivators and fertilizers in the world. They spend their lives from a few inches to eight feet below the earth's surface, eating dirt. This is a great help to both the farmer and the gardener, since it creates topsoil, enriches the soil, and loosens it to permit air to reach it and rain to be more easily absorbed.

Only at night do earthworms come out of their burrows. This fact resulted in the saying: "The early bird catches the worm." In the early light of dawn, some earthworms may still be out of their burrows.

For Billy and Jane, these "night crawlers" are the best "fishing worms."

. . . . The End

## CONSERVATION IN THE EBENSBURG SCHOOLS

Teachers who wish to incorporate a practical conservation education program in their curriculum can take a leaf from Miss Betty Davis, seventh grade teacher in the Ebensburg Grade School. The following article reprinted from the school's paper, *The Ebenette*, explains the excellent pattern for instruction followed by Miss Davis and, incidentally, hints of the seventh grade's enthusiasm for the course.

For the second consecutive year the study of conservation has played an important part in the lives of the Ebensburg Graders. The seventh grade again studied conservation under the direction of Miss Betty Davis.

Five different topics were studied by the five committees. These topics were: the conservation of soil, water, minerals, wildlife, and forests.

With the study we made posters, models of a farm, a coal mine, a forest ranger station, a reservoir, and a beaver dam. This work was supervised by Miss Helen Hildebrand. During American Education Week, our work was on display for parents and friends to see.

We took two field trips this year. One trip was made to the Game Lands near Patton. We visited the beaver dam, a turkey reserve, and places where feeding boxes had been placed. At the dam we saw the beaver's home but the beavers didn't

wait to see us. Mr. DeLong and Mr. Miller, Game Protectors, planned the trip and made the necessary explanations to us.

On the second trip we visited a lumber mill owned by Mr. Louis Long. Mr. Cletus Bopp, the foreman showed us around the mill and explained the uses of the various kinds of lumber as well as the workings of the various pieces of machinery we saw in operation.

After our written reports were completed, we made an oral report to the class. This was done before each trip, by the group connected with the field trip. We learned much from listening to the reports of the different committees.

We owe a debt of thanks to the people mentioned above and also to the following who helped make our conservation work a success: Our principal, Mr. Weyant; Mr. Rowland Tibbott, for displaying our projects in his store window; The Mountaineer Herald and the Johnstown Democrat for taking pictures, and the parents and friends who so willingly gave up their time to drive us on our field trips.

During the week April 7 to 13, we observed Conservation Education Week. We hope that people will begin and continue the practice of conservation, which is so necessary at this time.

THE SEVENTH GRADE

# FIELD NOTES

## Footloose Crows

**READING**, Berks Co.—The Berks County Federated Sportsmen are offering a trophy to the Member Club who turns in the greatest number of crow feet. This contest has really created quite a group of crow shooters. It is easy to find dead crows in most of our fields, but they are usually without feet. The North End Club of Reading is offering three shells for each pair of crow feet. District Game Protector J. A. Leien-decker, Reading.

## Meat On the Menu

**CANTON**, Bradford Co.—On March 23, Gerald Syphert found a gray fox den with the following animals lying outside the entrance; one weasel, one muskrat, four rabbits, three chickens, one mouse, one mole and parts of a deer hide. These were all recent kills except the deer. District Game Protector Duane E. Lettie, Canton.

## Game Needs Food and Cover

**DALTON**, Lackawanna Co.—The need for food and cover improvement was more forcibly brought to mind as a result of intensive coverage of parts of my district. Where food and cover conditions were good, game was fair to very good with grouse showing up fairly well over areas covered. Rabbits were scarce to very good, depending on food and cover conditions and squirrels were scarce. District Game Protector Philip S. Sloan, Dalton.

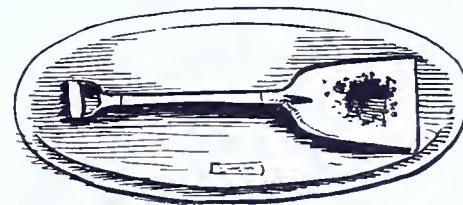
## Springtime Tragedy

**EAST STROUDSBURG**, Monroe Co.—Forest fires have taken a high toll on State Game Lands No. 38 in

Monroe County. In one fire this month 1500 acres burned over the Deep Lake section. Over twenty dead deer, many rabbits and grouse nests were found by Fire Wardens fighting the fire during the three day burn. This destruction of valuable game food and cover was the work of an arsonist who at this time has not been apprehended. District Game Protector John H. Doebling, East Stroudsburg.

## Armor-Plated Fox

**EAST RUSH**, Susquehanna Co.—Recently a farmer living near East Rush, upon opening the door to his barnfloor, saw what he thought was a fox lying on a small pile of hay. Re-



treating, he procured a shotgun and let it have "it." Upon inspection he found that he had shot a new scoop shovel that had turned brown with rust. Just shows how fox conscious the people here in Susquehanna County really are. District Game Protector James W. Clouser, Montrose.



### Can't Keep A Good Man Down

BUTLER, Butler Co.—I was recently told the following story by Mr. Charles Abernethy, Jr., one of our day-old chick co-operators:

"As we drove off the paved road onto our dirt township road, we were often entertained by the antics of a family of chipmunks frolicking about in the road. As we approached they would dart into their home—a hole in the road. Then one day a huge roadscraper and asphalt truck came along and made a paved road over their home. A few weeks passed and we were driving along our new road when—lo and behold! what should we see but our chipmunks family scurrying about as usual. All of a sudden they darted down into their old home in the road—they had somehow dug through the asphalt and restored their little home again. District Game Protector Paul R. Miller, Butler.

### Dog Owners—Read This

ELKDALE, Susquehanna Co.—Not too long ago Mr. Frank Hallstead sent word that dogs were chasing deer on his farm in the vicinity of Elkdale. It seems he and his son heard dogs running on the hillside behind their barn and, knowing dogs were in the habit of chasing deer, rushed out with their rifles. The deer

was already down and a volley of shots frightened the dogs away. The deer, its flanks chewed almost to the bone and its ribs bare, was taken to the barn to be nursed back to health. But the deer was too far gone for it died during the night. Believe me, any dog owner who could see a doe, heavy with fawn, torn to pieces and virtually eaten alive would certainly keep his dog confined. District Game Protector Donald G. Day, Gelatt.

### Where'd You Come From?

WEATHERLY, Carbon Co.—A full grown male coyote was caught in a number two fox trap by John Meyers of R. D. No. 1, Weatherly, Pa., during the early part of April. The animal weighed thirty-six pounds and appeared to be in good condition. The stomach of the animal was opened and it contained parts of deer, rabbit and chicken. Evidently he found the surroundings in this area to his liking according to his diet. The trapper was very proud of his catch, as was the Hudsondale Rod and Gun Club, which has sponsored a predator control program of its own. The club furnishes traps to interested members and they have done a good job in this area in the past year. Meyers is doing a good job on the foxes for the short time he has been trapping. He alone has taken seventeen foxes and the coyote so far this spring. District Game Protector Glenn A. Kitchen, Weatherly.

### Wanton Killing

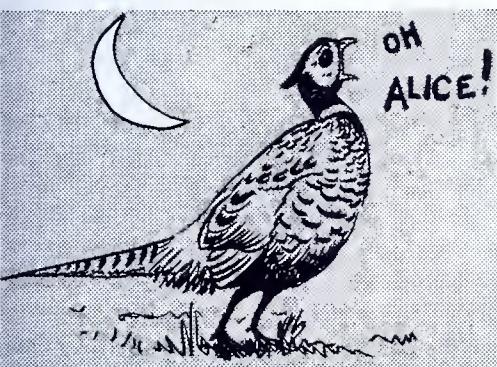
SUSQUEHANNA, Susquehanna Co.—Recently I received a call to go to the outlet of Montrose Lake to see an animal that a man had found while fishing. There I found a large male otter, possibly killed by someone fishing the stream. The otter had obviously been deliberately killed, as the skull was badly crushed. District Game Protector Irwin A. Weibel, Jr., Susquehanna.

### Eagle Likes Pork

**EXCHANGE**, Montour Co.—According to a report received from Mr. Lloyd Shook, a farmer residing in Propagation Area No. 16, he recently saw a large bird lower its wings and sail to the ground near Hillisquaque Creek which flows through the Propagation Area. He flushed in the direction that he saw the supposed hawk land. When he arrived at the spot he discovered the remains of a small pig and only a few feet away sat the large bird which he identified as a Bald Eagle. The bird flew to a nearby tree and watched him for a short time and then flew high into the air. Mr. Shook was at a loss to understand just what the bird was doing in Montour County, but since he did not own the pig, said he was glad to see an eagle at such close range. District Game Protector Bruce P. Yeager, Northumberland.

### Ringnecks Almost Human

**HARLANSBURG**, Lawrence Co.—During the last week in March I have noticed that the ringnecks in Lawrence County, are keeping very late hours. I have observed a number



of birds running around and crowing at 10 and 11 o'clock at night. Under these conditions the predators have no trouble finding their pheasant supper for the evening. District Game Protector Arthur T. Biondi, Mercer.



### City Slickers

**UNIONTOWN**, Fayette Co.—It's unusual to see hawks in the middle of a city, but in this case a pair of sparrow hawks seem to prefer the city environment to that of the wild, and have taken up their residence under the eaves of the eleventh floor in the Fayette Title and Trust building, Main Street, Uniontown. The nest is located above the very center of the business district, but the noise of busy throngs below and the roar of city traffic seem to cause the birds little or no concern and their activities have become a source of great interest to some of the apartment dwellers on the eleventh floor.—District Game Protector T. W. Meehan, Hopwood.

### Snowbound

**SULLIVAN CO.**—On March 12, 1952, while working in Sullivan County on Rabies Control work, I happened to see a lone meadowlark huddled in the snow. The ground was covered with about a foot of snow and it looked half frozen. Also saw several robins the next day. Game Propagator, Keith C. Hinman, Cambridge Springs.



# *Conservation Education Moves Forward*

By Henry Klonower

*Executive Director, The Pennsylvania Conservation Education Laboratory for Teachers*

CONSERVATION has been given its rightful place in the education program. The movement is no longer the sole interest of the sportsman, the forester, the mineralogist, the agriculturalist, and members of groups pledged to the proper use and the preservation of material resources. Teachers have moved in to help in the dissemination of information and in the development of right attitudes in a wide-spread conservation program. The Conservation Laboratory for Teachers has been in a large measure responsible.

The first Conservation Education Laboratory for Teachers conducted six years ago on the campus at the Pennsylvania State College and continued during the past six summers

has influenced the instructional program in the public schools of the Commonwealth. More than 400 teachers have profited from the experience in the Conservation Education Laboratory for Teachers. As a result of the instruction received in the Laboratory, concrete results have followed in activities such as: REFORESTATION, in Berks County pupils in a school helped to plant 20,000 trees as a memorial; in the field of WRITING, a Philadelphia teacher contacts 15,000 persons annually through her museum work bearing on conservation; in SOIL CONSERVATION, a fifth grade teacher in Erie County takes her classes to observe good soil conservation practices; in specially planned

**I**ELD TRIPS, a biology teacher in the schools of Scranton, arranges conservation field trips for 500 pupils and adults; in WILDLIFE CONSERVATION, a Washington County teacher is instrumental in sponsoring junior sportsmen's clubs; in VISUAL AIDS, a teacher in Perryopolis gives illustrated conservation lectures to 0 adult organizations.

Only a small fraction of a number of the projects reported in answer to recent survey are outlined here; limited space prohibits a full listing of all the projects supervised by former students who have attended the Pennsylvania Conservation Education Laboratory for Teachers.

The Seventh Conservation Education Laboratory will hold two sessions on the campus at the Pennsylvania State College this Summer, June 30 to July 19, and July 21 to August 9. The Laboratory will offer these opportunities:

1. To obtain information from first-hand observation of natural resources.

2. To understand the interrelationships between natural resources and between man and resources.

3. To develop a philosophy toward natural resources use that will carry over into everyday living.

4. To become familiar with the efforts being made by various agencies toward conserving natural resources.

5. To study efficient and practical methods of correlating conservation concepts into classroom teaching at various levels of pupil ability.

6. To become familiar with instructional aids useful in conservation teaching.

7. To explore ways and means of influencing community action in conservation education problems.

The Pennsylvania Conservation Education Laboratory for Teachers was established in 1946 as a part of the Summer Sessions of the Penn-

sylvania State College to stimulate and facilitate the teaching of conservation of natural resources in the schools of the Commonwealth. The Laboratory is assisted by various departments of the State and Federal government, by the several Schools of the Pennsylvania State College, and by numerous organizations throughout the Commonwealth interested in conservation.

The Laboratory is made possible by the generous support provided by several departments of the State Government, including the Pennsylvania Game Commission, the Pennsylvania Fish Commission, the State Planning Board, the Department of Forests and Waters, the Department of Public Instruction, the State Department of Health, the Department of Mines, the United States Soil Conservation Service, the United States Forest Service. Conservation Groups throughout the State, many Garden Clubs, and many individuals interested in conservation have helped financially and otherwise. The Schools of Agriculture, Education, Engineering, and Mineral Industries of the Pennsylvania State College provide much of the instruction. The Federation of Sportsmen's Clubs has generously contributed scholarships for teachers who attend the Laboratory.

The teacher education program in Pennsylvania continues to move forward in this field. Teachers will teach conservation better as they become more fully informed. There is an urgent demand for more conservation education. The education of teachers is important in relation to the preservation of game, fish, forests, minerals, and soil, but such a program must also awaken a moral consciousness. The program must teach the emerging generation that each citizen must share in the responsibility for the proper use and preservation of nature's gifts.

. . . *The End*



PGC Photo by Cady.

*Ordinary fabrics have a tendency to match the colors of autumn foliage.*

**Progress Report on Study of**  
*Safety Colors for Hunting  
Clothing*

By Robert M. Latham

FOR years, the Pennsylvania Game Commission has been disturbed by the number of hunting casualties which accompany the various open gunning seasons. It has sponsored legislation which severely penalized hunters who were guilty of carelessness in the field; it has required a detailed report of all hunting "accidents" and has studied these reports carefully in an effort to determine the causes of these unfortunate incidents; and it has made safety suggestions based upon these findings.

Presently, the Commission is continuing its fight to provide maximum

safety for its 850,000 hunters. It feels that a human life is priceless, and that there should be no cessation of effort to prevent casualties and to save lives whenever possible. During 1951, 411 hunters were killed or injured by gunfire in Pennsylvania, and only 23% of these were self-inflicted. Some of these casualties resulted from pure carelessness. For instance, 6 were killed and 71 injured because guns were placed in a dangerous position—leaned against a car or tree where they fell or were knocked down and discharged. Others shot their hunting companions while loading or un-



PGC Photo by Cady.

*Daylight fluorescent fabrics stand out in bold contrast to anything nature provides as background.*

oading their guns. And still others had obsolete or unsafe guns blow up in their hands. This sort of carelessness can only be corrected by education of the hunter. The Game Commission is attempting to accomplish this end by showing motion pictures, by releasing informative articles, and by lecturing and demonstrating in schools, before sportsmen's clubs, and over the radio. And the hunter is constantly reminded of his obligations by safety slogans on posters along the roadside in hunting territory.

Two hundred and fifty-seven men were hit by shot or bullets deliberately fired by other hunters. Only 23 of these were actually shot in mistake for game, but the remainder were in the line of fire or were hit by ricochetting bullets. At any rate, *the great majority of these casualties occurred because the shooter did not see the man who was to fall victim to his gun.* A research project is currently under way to determine methods for preventing some of the deaths and injuries from this cause.

What could be done to make a hunter immediately recognizable against any background or have him stand out so prominently that he could never be mistaken for game? A bright color which would contrast sharply with the surroundings seemed to be the obvious answer. But "red" has been recommended for this purpose for years, and men are still being shot on occasion while wearing red. Perhaps the simple designation "wear red" was not enough. The questions arose: "How much red? What shade of red? Does red still appear red at long range, or in poor light as is found at daylight and dusk, in deep shade, or in rainy weather? What happens to red when it becomes wet? Is red an effective color at all times of the year, or does it blend with the reds of maple, black gum, and sumac in autumn? Does some other color perhaps offer better year-round protection?"

With these questions in mind, a study was begun. First, a wide variety of colors and color patterns were

selected for trial. The list included reds, oranges, yellows, greens, browns, grays, tans, black and white checks, red and white combinations, red and black mixtures, and white. Included among these were the new daylight fluorescent colors, known as "Day-Glo" or "coldfire" colors. Subjects wearing caps and jackets of these colors were paraded in front of all kinds of natural backgrounds and through a variety of game covers for the movie camera. They stood or sat wearing the same clothes and in the same surroundings for "stills."

Studies were made during mid-summer at the height of the "ground-hog" season. More Pennsylvania hunters are shot in mistake for this animal than any other, including the deer. What color cap or hat could a hunter wear which would contrast with green clover and green leaves? Head protection seems to be the important consideration at this time of year, because woodchuck hunters are most often shot through the head.

Later, a series of color movies and slides were taken during the small game seasons in October and November to record the value of the clothing being tested when the tree foliage is highly colored or brown, and the corn and weed growth is mostly brown, gray, tan, or straw colored. Still later, the tests were repeated in mid-winter when snow covered the ground. This "deer season" setting gave a contrast of colors against a background of snow, gray rocks, green laurel and hemlock, and dark tree trunks.

At the same time, Switzer Brothers, Inc., Cleveland, Ohio, the originators of the "Day-Glo" colors, agreed to make instrumental comparisons between the intensity of the color emitted by the daylight fluorescent fabrics and that of ordinary bright colored cloth of similar shade.

The colored movies and slides and the tests made by the spectrophotometer all indicated the same conclusions:

(1) The daylight fluorescent colors (particularly *Fire Orange* and *Neon Red*) were four times as bright as ordinary orange or red *under poor light conditions*. In fact, these colors were most vivid in deep shade or in the late hours of evening or early hours of morning. In poor light ordinary reds and oranges tended to become gray or black, even at relatively short distances.

(2) In good or poor light, the fluorescent colors retained their identity *at long range* when ordinary colors faded to gray or black.

(3) The fluorescent colors contrasted sharply with all backgrounds whereas any of the ordinary colors are duplicated by the flowers, leaves or stems of plants at some time of the year.

(4) The fluorescent colors are not simulated by any mammal or bird of the state, whereas all of the ordinary colors may be reproduced by our native animals. It must be remembered that, among our birds and mammals, nearly any shade of red, from dark red to scarlet, can be found. Men have been shot for red foxes!

In summary, preliminary tests indicate that the new daylight fluorescent or "Day-Glo" colors in *Fire Orange* or *Neon Red* are perhaps the colors most conducive to safety in the field or forest. Tests will continue, and it is hoped that positive recommendations can be made within the next few months. A report in color, showing the effectiveness of the daylight fluorescent colors for hunting safety, is planned for a future issue of the GAME News.

. . . *The End.*



# Books For The Outdoorsman

## BLACK BASS FISHING

By Robert Page Lincoln

16 pages. Numerous scratchboard drawings by Steve Miller. Published by The Stackpole Company, Telegraph Building, Harrisburg, Pa. 1952. Price \$5.00.

With a lifetime of bass fishing under his belt and countless fishing experiments with such pioneer anglers as Dr. Henshall, Willig and Fred Arbogast to his credit, Robert Page Lincoln has finally put his fishing knowledge in book form. The result is one of the most comprehensive and up-to-date angling publications on the market today. Opening with some excellent descriptive matter on the different species of bass found in American waters—largemouth, smallmouth, Kentucky and white bass, the bulk of the book deals with various techniques and tackle for catching these fish.

A partial list of chapter headings will give you some idea of what to expect: *The Art Casting Rod and Reel, Plug Lures and Their Kind, Metal Lures and Other Attractants, The Pork Chunk and Pork Rind, Live Bait Fishing, Night Fishing, Fly Rod Tackle for Bass, Fly and Spinner Combinations, The Gentle Art of Spinning, Bass of the Reservoir Lakes, Ozark Float Trip and Conservation.*

In these and the remaining fifteen chapters practically every phase of bass fishing has been exhaustively treated. No angler, tyro or expert, can fail to learn some fishing tricks by reading a copy of *BLACK BASS FISHING*.

## HOW TO KNOW THE BIRDS

By Roger Tory Peterson

44 pages. Illustrated with more than four hundred line drawings and four color plates by the author. Published by Houghton Mifflin Company, 2 Park St., Boston, Mass. Price \$2.00.

Written by an ornithologist with a flair for teaching, *HOW TO KNOW THE BIRDS* is designed to aid the beginner in bird identification. Instead of the confusing array of detailed color plates found in many publications on birds this book starts at the very beginning. With the realization that the average amateur bird watcher finds it difficult to furnish even a meager description of a feathered stranger, Peterson

## BOOK NOTES



emphasizes the basic points of identification to be noted—size, shape, etc. From there the process of identification follows a natural course covering actions, flight characteristics, field marks, voice, etc. Each step is illustrated by the author's splendid drawings. A section in the back of the book is devoted to silhouettes of nearly a hundred birds, a unique method of teaching bird types by form.

This handy little book once again exemplifies Roger Tory Peterson's rare quality of being able to see his subject through the eyes of the beginner. Fortunately for the aspiring young naturalist there is at least one ornithologist in America who has not forgotten the difficulties of his early years as an amateur bird student.

## BIRDS OF NEWFOUNDLAND

By Harold Peters and Thomas Burleigh

431 pages. Completely illustrated with full color reproductions of paintings by Roger Tory Peterson. Published by Houghton Mifflin Company, 2 Park St., Boston, Mass. 1951. Price \$6.00.

The average bird student's first reaction to this book will most likely be, "What do I care what kind of birds they have in Newfoundland?" However, a glimpse between the covers of this beautiful volume will more than likely cause a complete about face. For one thing, a surprisingly large number of these Newfoundland birds are species that are found in eastern United States, and one sees many old feathered acquaintances while glancing through the color plates.

Of course, the serious bird student will welcome this publication at once for what it is—the first complete and authoritative natural history of the birds of Newfoundland. The text treats each species individually. Descriptions, field marks, voice, nesting habits, range and distribution, habits, etc., are given in detail. The descriptions of field marks are particularly useful to the tyro, while the notations on each bird's status on the island are invaluable to the advanced ornithologist.

Peterson has really outdone himself in painting the illustrations for this book. He treats the reader to 32 pages of full color plates showing 153 species of birds in authentic Newfoundland settings.



Photo by Hal H. Harrison.

*Deputy Game Protector Bill Guiney displays a "Samson Fox" shot by his son-in-law George Palahunik, on the Keystone Ordnance Works grounds in Crawford County.*

## *Ever Hear of a Samson Fox?*

By Hal H. Harrison

**I**F YOU are a trapper, a fox hunter, a breeder of foxes or just an outdoorsman, you have probably heard of a "Samson Fox." Perhaps you have seen one. But do you know what it is, why it is and where it got its name?

I saw my first "Sampson" at Conneaut Lake last winter. It was shot by George Palahunik, Shermansville, during a mass hunt at the Keystone Ordnance Works reservation in

Crawford County. His father-in-law, Deputy Game Protector Bill Guiney, saved the animal for me to see.

It was the poorest, scrubbiest-looking red fox I ever saw. Its pelt was wooly, rather than hairy, with a guard hairs missing. Its tail was flat, not bushy. Indeed, it looked like the tail of an alley-cat.

In investigating the name "Samson Fox," I was most fortunate. Mr. Bill Guiney, a student of the Bib-

eferred me to Verses 4 and 5, Chapter 15 of Judges. They read:

"And Samson went and caught three hundred foxes, and took firebrands, and turned tail to tail, and put a firebrand in the midst between two tails.

"And when he had set the brands on fire, he let them go into the standing corn of the Philistines, and burnt up both the shocks, and also the standing corn with the vineyards and olives."

A Samson fox, then, is one that looks as though it were singed by fire, like the ones Samson turned loose must have looked when the firebrands cleaned off the guard hairs. And that takes care of the origin of the name. But what causes the condition?

For this information I went to the Department of Mammology at Carnegie Museum, Pittsburgh. Here, I soon learned that there is very little known about Samson foxes. Mammalogist J. Kenneth Doutt ventured

the opinion that it is a genetic condition but he was not positive. The only reference made to it in Ernest Thompson Seton's monumental works is the following:

"Another freak is the 'scorched' or 'Samson Fox.' This has no long fur, nothing but wool; the cause of this is not understood, and the pelt is worthless commercially."

Assistant Curator Caroline Heppenstall found one reference by Frank G. Ashbrook in his "Silver-Fox Farming," a bulletin of the U. S. Department of Agriculture. Ashbrook writes:

"The term 'Samson' is applied to foxes devoid of guard hair and carrying a very inferior wooly underfur. This condition has been variously attributed to breeding, feeding and parasites. The real cause is not definitely known and for this reason it is highly inadvisable to use such foxes for breeding stock. The pelts have small value on the market."

. . . The End.



Photo by H. L. Strawbridge.

Here's a sight rarely seen—the underwater construction of a beaver lodge. Heavy rains washed out the beaver dam on the east branch of Little Sugar Creek in Venango County, leaving the "underwater" entrance of the lodge high and dry.



## GAME COMMISSION SCHOOL ENROLLS NEW CLASS

On April 26, the Game Commission held a written examination for 99 of its deputy game protectors and food and cover corpsmen who aspired to enroll in the Ross Leffler School of Conservation, from which Pennsylvania game protectors are required to graduate.

On May 15th and 16th, 56 applicants who qualified in the first test by attaining high grades were recalled to Harrisburg for oral interview and final physical examination. Of this select group 22 measured up to the rigid standards set by the game body. As previously decided by the Commission, however, only 17 were enrolled to fill the quota for the 7th student class, which began its course at the Conservation School on May 25. The new students' names and addresses follow:

Orbin L. Branthoover, Foxburg, Clarion County; William E. Cowden, R. D., McDonald, Washington Co.; Patrick W. Craven, R. D., Moscow, Wayne Co.; Edward J. Fasching, Allentown, Lehigh Co.; Norman Joseph Forche, Falls Creek, Jefferson Co.; William Erwin Fulmer, R. D., Bethlehem, Lehigh Co.; Paul Henry Glenny, R. D., Huntingdon, Huntingdon Co.; Charles Hertz, Indianola, Allegheny Co.; Gerald D. Kirkpatrick, Strattanville, Clarion Co.; William Edward Lee, R. D., Venus, Venango Co.; Harry Carlton Mertz, R. D., Coraopolis, Allegheny Co.; Leo Ellis Milford, Kane, McKean Co.; Arland P. Reed, R. D., Lehighton, Carbon Co.; Frederick Haugh Servey, Clarion, Clarion Co.; Richard Carlyle Stone, Argentine,

Butler Co.; V. Fern Thomas, R. D., Honey Grove, Juniata Co.; Alex J. Ziros, Westmoreland City, Westmoreland Co.

The training course for Pennsylvania game protectors—which is the most comprehensive and the first of its kind—was initiated in 1936. At the Conservation School, located near Brockway, Jefferson County, recruits are taught up-to-date conservation practices, law enforcement technique and other practical and technical subjects relating to their future work. The instructors at this School are specialists in their fields. Included are representatives from the Federal Fish and Wildlife Service, the F.B.I., the Pennsylvania Fish Commission, the Department of Forests and Waters, and others. About half the school term is spent in the field, where the students apply what they have absorbed in classes and acquire much valuable knowledge through association with experienced game protectors. When graduated as full-fledged field officers these men are qualified to discharge their duties capably, in the best interests of hunters and other citizens of the Commonwealth.

## ANNUAL HUNTER CASUALTY REPORT

The Game Commission has finished compiling the Pennsylvania hunting casualty figures for the year 1951. As usual, the report clearly tells how and where humans met death or injury by gunfire. However, the causes for these so-called "accidents" continues, in most cases, to be greed for game, lack of firearms experience and reckless handling of weapons.

sed in sport shooting. Last year, 25 persons were killed and 386 were wounded by hunter gunfire in the Keystone State. A little study of the following will indicate the needlessness of most of these gunner casualties. This information is based on figures and facts taken from hunting accident reports required by law. It offers the unpretty side of an otherwise pleasurable, beneficial sport.

Of the 25 fatalities, 9 were self-inflicted. Injuries to 300 of the 386 non-fatal cases were caused by other shooters. Twelve out of the 25 fatal cases were persons under 21 years of age. These more youthful hunters, though far less in numbers than those over 21, caused about 1/3 of the non-fatal cases.

Big game hunting accounted for 1 of the deaths and 37 of the injuries, while small game hunting deaths totaled 14, along with 349 injuries by gunfire. The shotgun was the cause of 9 fatalities and 309 woundings, while rifle shootings accounted for 16 deaths and 67 injuries. There were no fatalities due to pistols, but 10 persons were injured by handgun fire.

Leading casualty causes continue to be: gun placed in dangerous position, 6 deaths, 71 woundings; hunter slipped and fell (with safety off), 5 and 34; shot in mistake for game, 5 and 18; did not see victim in line of fire, 4 and 124.

Most of the casualties occurred as follows: in brush, 11 fatalities and 127 non-fatal cases; open woodland, 5 and 64; fields, 4 and 116; dense woodland, 1 and 45; roads, 2 and 25; conveyance, 1 and 2.

The weather conditions were: clear, 11 deaths, 159 injuries; cloudy, 9 and 85; rain, 3 and 85; fog, 1 and 7; snow, 0 and 36.

The ratio between the number of hunters killed by hunter gunfire in Pennsylvania in 1951 as against the number of licenses issued is about 1 to 34,200. That in non-fatal cases was 1 to 2,215.

It will never be known how many persons returned safe from hunting trips last year because they wore distinctive colors or glow-type fabrics that instantly identified them to other shooters as humans, not game.

Of the 411 persons shot while hunting in Pennsylvania in 1951, 272 would not have been saved by any type or color of apparel, however. They were the ones whose casualties were self-inflicted, who were shot by others through the unintentional discharge of firearms, who were struck by ricochet or stray shot, or who were hit while completely hidden from the view of other shooters.

## More Ducks For Keystone Hunters

The Game Commission's duck program for 1952 calls for about 6,000 ducklings, a number comparable to those raised and released in Pennsylvania last year. Without waiting for contracted shipments of duck eggs from Canada the Commission has already hatched 1,200 mallards and mallard and black duck crosses from eggs obtained from other sources. These ducklings will be released the latter part of this month.

This spring the Game Commission is turning over 5,000 ringneck pheasant eggs to the Province of Saskatchewan in exchange for the same number of duck eggs, mostly mallards. The eggs are to be hatched and the birds released in Pennsylvania. The traded pheasant eggs are in excess of the number that can be handled at the state game farms. Robert E. Latimer, the Commission's supervisor of waterfowl coordination, is presently in the Canadian province studying waterfowl and attending to the duck egg shipments. It is believed that ducks hatched from the eggs of wild stock will develop the best possible fowl for the Commonwealth's duckling release program, now in its second year.

Officials point out that the pro-

gram is an attempt to develop a larger nesting population in the state and eventually increase the number of these migratory birds for hunters' guns.

Last year, almost 6,200 leg-banded ducklings were released in out-of-the-way water areas in the Commonwealth. It was the expectation of the Game Commission that birds surviving predation and hunters' guns, in this state and the south, would return to Pennsylvania this spring to produce broods in the localities where they were liberated. While the Commonwealth lacks marshes and bodies of water necessary to the development of waterfowl in numbers comparable to some other states, the program should materially increase our native duck population within a few years.

## NWF WANTS MORE PUBLIC LAND

ON March 21, 1952 the delegates to the Annual Meeting of the National Wildlife Federation at Miami, Florida, unanimously approved the following resolution:

### Resolution

WHEREAS, some thirty million Americans now pursue the sports of hunting and fishing as favorite and necessary forms of recreation. As the population of the nation continues to grow, and as the pressures of urban and industrialized living make it physiologically and psychologically essential for more and more people to seek release and relaxation in the out-of-doors, this army of hunters and anglers is bound to increase. In many areas, especially in the more populous states and in regions surrounding the larger cities, privately-owned lands cannot accommodate more sportsmen. As a matter of fact, many farmlands cannot practically and satisfactorily accommodate as many hunters as now seek to use them, and should not be expected to do so.

THEREFORE BE IT RESOLVED, that the National Wildlife Federation recommends that the various state game and fish departments plan for, and direct their efforts toward, the establishment of public use areas for the purpose of relieving the pressure on private lands. This recommendation is

called especially to the attention of those states wherein extensive public lands are unavailable and wherein urban population pressures have intensified the problem of providing hunting and fishing opportunities.

The Federation further recommends that its various state affiliates cooperate with and support their game departments in the achievement of this end, including the increase of hunting and fishing license fees if deemed necessary to finance the establishment of public-use areas.

WHEREAS, much water development is currently being carried on by federal agencies which will result in additional fishing in the several states, and

WHEREAS, considerable land is being purchased adjacent to such waters, the title to which is to be held by the federal government, and

WHEREAS, the sportsmen of the several states should be allowed to utilize the waters of these areas for fishing, and the adjacent land for hunting, under regulations of law for the regulating of such fishing and hunting,

NOW, THEREFORE, BE IT RESOLVED, by the National Wildlife Federation in convention in Miami, Florida, that the various federal agencies responsible for such water development be requested to confer and develop a uniform policy for the management of such areas for hunting and fishing purposes.

BE IT FURTHER RESOLVED, that such policies include free public access to shorelines and waters, free access under agricultural leases where practical for hunting, and that any areas where hunting or fishing is permitted, the state fish and game laws shall apply and the appropriate state agencies shall be given a voice in determining management.

Although sportsmen everywhere will welcome additional land for public use, Pennsylvania's hunters and anglers are more fortunate than many. At present there are more than 3 million acres of publicly owned land in Pennsylvania. Of this approximately 2,700,000 state owned acres State Forests comprise, 1,778,191 acres and State Game Lands comprise 901,363 acres. Cooperative Farm Game Projects total 1,330,223 acres of leased land. In addition we have within the boundaries of our state the 750,000 acre Allegheny Forest. Practically all of this acreage is open to public hunting.

# Picnic Time

By Grace O. Beach

**W**ARM weather is here again and the great outdoors is calling you to come out and enjoy the beauties of nature. It invites you to listen to the song of the birds, the rustle of the trees, the ripple of the water in the stream, all harmonizing together to make the sweetest music ever heard. It urges you to forget your troubles and worries for a little time and relax in peace and beauty.

If you listen to this call you will find after a day outdoors with no jangling doorbells or telephones that you will come back rested and refreshed to take up your duties with a new zest. Any sportsman can tell you, worries and troubles will seem less burdensome and your nerves less taunt and highstrung.

You have all the summer before you, and Diana hopes you are planning to use every moment of it for yourself and family to the full advantage. Absorb all the fresh air and sunshine (be careful you don't get too much at one time) you can, and get all the rest and relaxation possible.

Plan some crow hunting expeditions; take some hikes in the woods and watch nature in action; go swimming, boating and fishing; or, just pack up a picnic meal and take the family to some nice secluded spot for your lunch or supper. Get out and have fun!

You will have fun, too. The fresh air and relaxation seems to make one hungry and the food always seems to taste better outdoors. These outdoor meals need not be the cut and dried picnic fare, they can be different and zestful, and it need not be a big job on your part either.

Your Diana and her partner spends so much time outdoors, usually tak-



## DIANA DOINGS

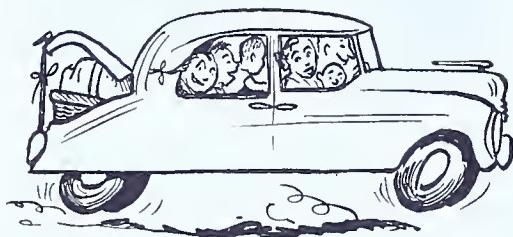
ing off at a moments notice, that we had to get picnic lunches and meals down to a science. Today it is no chore at all to get a picnic together and it takes very little time. Here are some little tricks and menus that we think will help you get more enjoyment and more leisure out of your trips and you will also have better outdoor meals.

First, equipment is one of the main essentials to easy and convenient outdoor meals. Over a period of time we have acquired a brown zippered "Coolapak" case, a zippered fibre glass insulated "Thermal Pac" case and a zippered case containing two thermos bottles with an oblong tin box in the center.

The Coolapak case is insulated too, and has two containers for ice cubes that snap on each side, inside the case, making it a veritable ice box. This is excellent for carrying milk, cool drinks, butter, meat, tomatoes, celery, lettuce and fruits, or anything you wish to keep very cold. We chill everything thoroughly to pack and it stays that way all day. It is an easy one-man carrying case which is always helpful and comes in two sizes. We like the large family size. Today, they cost about \$8.95 and \$13.95.

The insulated Thermal Pac case also keeps things cold or warm as you wish. We use it mostly for warm foods, it can be utilized for both depending on your planned menu. These cases are about \$6.00 and up on the market. There is also the "Skotch Kooler" which sells for around \$7.95.

There are also on the market, small, handled refrigerator chests that many people find equally con-



venient and useful. One chest sells for around \$10.95 in the small size and \$15.95 for the large size.

The thermos case carries hot drinks, or cold if you wish, and the tin receptacle in the center is excellent for cake and cookies. They run approximately \$16.50.

These three cases have made trip after trip over several years and will give many more years of service. They constitute our best investment and we wouldn't part with them for any consideration.

Our additional equipment consists of plates, cups and glasses all in the pliable unbreakable plastics, which nest neatly together taking up little room. Spoons, forks and knives are also plastic and very inexpensive.

We use one of the large plastic table cloths that come in so many gay patterns; several plastic zipper bags of various sizes; pliable plastic containers of different sizes all of which can be used in the home as well, although we keep all picnic materials together and use them only for that purpose. That eliminates scurrying around hunting things at the last moment or when we're in a hurry.

Also part of our equipment are plastic salt shakers and a square plastic bottle bought at a cosmetic counter which holds sugar. A small sharp knife with guard, combination can-opener-bottle-opener and cork screw, cooking tablespoon and a fork.

When we return from a picnic, the cases are emptied and wiped out

carefully and left open to air. Salt and pepper shaker and sugar container are checked and refilled. The thermos bottles are washed and rinsed and set to air. The plastic table ware and containers and plastic cases are washed and dried. When thoroughly dried and aired all is stored back in the cases ready for another trip and put away where they can be easily available.

The plastic bags on the market are so varied in size and shape that you can easily find one for most any use. An excellent one is the zippered bread case. It holds a full loaf and we use it for packing the sandwiches, keeping them fresh, and an easy way to pack them. You will find the rectangle plastic fruit bag is also an excellent investment as are the smaller graduated sized zipper bags. These we use for sundry articles, such as lettuce, celery and tomatoes.

The one and two quart pliable plastic containers with well fitted lids are fine for potato salad, baked beans or any such type foods and the smaller ones for pickles, olives, radishes, minced onions, and the like.

Now let's plan some picnic menus. One of our favorites when you have time for a little preparation is fried chicken, bread-and butter sandwiches, potato or macaroni salad, pickles, fresh green onions or radishes, coffee, cup cakes or cookies, fruit, milk, and your choice of cold drinks for in between thirst quenchers.

You can have this picnic either hot or cold or combination of both, with the type cases we mentioned before. Sometimes hot chicken and hot potato salad make it different. By putting the piping hot food in plastic containers or plastic party bowl and placing it immediately in the Thermos case and zipping it shut, you can have a hot meal. Put all the other foods in the cold case including the bread and butter sandwiches, and you have a perfect outdoor supper.

Another good picnic meal with a little time for preparation, is baked

beans and weiners or barbecue meat with barbecue sauce, buttered buns or sandwiches, pickles, minced onions or fresh green onions, celery, fruit, cake or cookies. Pie can be substituted and is easily carried in the plastic wedge containers.

To make the barbecue sandwiches, prepare the sauce by putting in a pan a bottle of chili sauce,  $\frac{1}{2}$  cup catsup,  $\frac{1}{2}$  cup vinegar,  $\frac{1}{2}$  cup water, 1 teaspoonful of mustard and 3 tablespoonsful of brown sugar. Let these ingredients simmer slowly till proper consistency is obtained, stirring frequently. Add barbecue meat and simmer long enough for it to heat through well. Pack while piping hot into container and insulated case. This recipe is for one pound of meat. The sandwiches are made as eaten. If using weiners, split and pan fry or broil, add to barbecue sauce and simmer till thoroughly heated, then pack.

Another good menu is hot meat or ham loaf (don't slice till ready to eat), hot potato salad or hot baked beans and sliced tomatoes, lettuce, olives or pickles, celery and buttered sandwiches. The meat loaf and other foods can be cold and is equally good.

Of course if you have a stove, you can prepare the barbecue sandwiches in the open and there are always those old standbys, hamburgers, cheeseburgers and steak sandwiches, fried potatoes, minced onion and all the fixings, and whatever you wish for dessert. When melons are in season try taking along a couple chilled melons.

Hamburgers can be patted into cakes and each cake laid on a square of waxed paper, piled on top of each other and then all wrapped in waxed paper. They come apart easily for cooking and are readily handled.

Good stove quickies can be gotten together at a moments notice if you keep some barbecue sauce made up on hand in the ice box and a couple cans of potted meats on the shelf.

Stick them in the picnic kit and when you are ready to get your meal, pan brown the sliced potted meat, add the barbecue sauce, simmer until the sauce penetrates the meat for flavor and you have delicious quick sandwiches with no previous preparation.

If you like salmon as we do, its perfect for quick cold picnic lunches with a different flavor. Put the number of cans of salmon needed in your cold picnic kit, bread and butter sandwiches, lettuce, tomatoes, pickles and whatever else you have available to round out your lunch. When you are ready to eat, open the tins of salmon and turn out on a plate. Flake salmon and put between bread and butter sandwiches and serve.

Children and most grown ups like peanut butter and jelly, and peanut butter and bananas mixed together make good sandwiches and healthy ones especially for the children.

With a stove you can make peanut butter and hot bacon sandwiches which are easily prepared in the open. Creamed cheese and hot bacon with sliced tomatoes are exceptionally good. For these we like the bread toasted or pan grilled.

These are all good meals and are not in the cut and dried variety of the usual picnic lunch. We think you and your family will relish them as we do and as the friends who picnic with us do. You will find these meals easy to put together and you will probably think up some additional attractive menus of your own. We are always looking for new ideas and if you come up with any send them along.

And now one final tip. Don't leave any trash behind you. Always clean up your picnic spot so others, who come after may enjoy the unmarred beauty of nature. If you build a fire, be sure it's out before you leave. *Help to keep Pennsylvania green.*

Happy picnicking and a happy summer.

. . . *The End*

# Don't Let Corrosion Ruin Your Gun

By Ed Shearer

CORROSION, the chief factor in the ruination of many fine guns, is particularly active during the humid summer months. A re-hash of the events of recent years will explain the widespread presence of this troublesome condition.

The rising cost of ammunition has sent the reloading game soaring to new heights. Then to complicate matters the loading companies shut down on the sale of components, especially primers. For some time the one remaining source of primers was the government, and NRA members proceeded to lay in a supply of government primers for themselves and reloading friends. The new crop of reloaders soon found there was a ready market for ammunition at reduced prices and proceeded to sell to all and sundry. These primers all contain a #70 mixture which is a chlorate formula, something the present-day shooters have little experience with. There also appears to be a fair quantity of cupro nickel jacket bullets putting in appearance, thus introducing metal fouling into the picture. (In times of high prices and scarcities you can look for almost anything.)

A factor that contributes to the general disregard of corrosion is the misleading advertising by some manu-

facturers themselves. I have seen plenty of it that infers that their product makes cleaning unnecessary—about the same thing as a soap manufacturer telling junior that using his brand of soap makes washing behind the ears unnecessary. The truth of the matter is that non-corrosive primers do not prevent rust in the bore. It's true that while there is nothing in the fouling from such primers that would cause rust, it is equally true that there is nothing in the primer compound to prevent rust either. Non-corrosive primers have simplified cleaning, but *clean you must* or sooner or later you will pay the piper to the tune of a new barrel.

Corrosion is simply rust caused by water, salt in the presence of water or more rarely, acid in contact with steel. There is no way to remove the effects of corrosion as it is not a deposit but the eating away of the steel itself.

The primer has been responsible for more grief in the gun barrel than any other component in the cartridge. For years barrel after barrel was ruined, including some of the writer's, no matter what concoction was used. Everybody blamed a different cause. Nitro-glycerin powders came in for some blistering remarks.

Finally the Bureau of Mines, at the instigation of the Ordnance Department assigned one of their research men to the job of finding out what gives. Wilbur J. Shaw tackled the job with a laboratory full of equipment and made a most exhaustive research of the problem.



From the powder angle they fired every type and found that the powder residue in itself was apparently non-corrosive, especially in the more modern formulas. They fired normal charges in specially constructed guns that were fired by electricity in place of the normal primer. Result, no corrosion.

Then they used the regular chlorate primer which was in universal use up to the advent of the non-corrosive primer. The result of this test was just, and plenty of it. It was found that the primer was leaving very small quantities of potassium chloride distributed throughout the bore.

Potassium chloride is a salt similar to common table salt. It has the same property of attracting moisture from the atmosphere. This results in a concentrated brine solution which attacks the steel with great rapidity unless the priming salts are removed after firing. No amount of solvents will remove these salt deposits.

After locating the cause of corrosion in gun barrels they proceeded to test the various solvents and concoctions on the market that were supposed to prevent this rusting. Not one of them would remove the priming salts for the simple reason that salt is not soluble in oil.

The recommendation to the Ordnance Board in pamphlet #188 was to the effect that all cleaning on military small arms with prepared fluids be discontinued. The only safe method was to swab the bore with hot water when available and cold water when not.

In other words it took a scientist and a laboratory full of equipment to remind us of a fact known by all old-timers, from Daniel Boone right up to where we got lost in the fog of smokeless powder, metal-jacketed bullets and high velocity.

Today the non-corrosive primer has simplified cleaning to a couple of minutes work.

Under most conditions it consists of three states: loosening the fouling,

removing it, and protecting the bore with oil or grease. This should be done no later than the evening of the day the gun has been fired as the amount of moisture in the atmosphere greatly increases at night under most conditions.

To loosen the fouling swab the bore with a patch of correct size well saturated with a good solvent. If solvent is not available, hot or cold water will do the trick.

Then swab the bore with clean patches until they come out fairly clean and dry. Now hold the bore up to the light. If it is clean and bright O. K. But if there are dark streaks on the surface or maybe leading, it calls for a brass bristle brush dipped in solvent. Run this through five or more times and dry as before.

If the gun is to be used within a week a good oil is enough. If it is to be stored for a time use inhibiting grease and see that the bore is thoroughly coated. Wipe off the exterior metal parts with the same patch and the job is done. Takes about five minutes.

Metal fouling is another troublesome condition. This fouling can take place with any jacketed bullet whether gilding metal or cupro nickel jackets. You will run across metal fouling usually in two forms. The gilding metal or copper jacketed bullets are generally in the form of a smear and the patchy type that is characteristic of cupro nickel. Sometimes the copper jackets give you the same thing when you run into soft jackets or try to drive them at greater velocity than they were intended for. With the patchy type the cure is simply an ammonia solution such as Winchester Crystal Cleaner.

A really bad case calls for an ammonia solution made up as follows:  
 Ammonia Persulphate .... 1 oz.  
 Ammonia Carbonate .... 200 Grains  
 Cold Water ..... 4 oz.  
 Stronger Ammonia (28%) 6 oz.

To use, plug the breech with a rubber cork. Place a tight fitting rub-

ber hose in the bore and fill the bore completely full, until the solution rises in the hose. Care must be taken not to spill any solution on the exterior as evaporation will cause rust. Let the solution in the bore about 20 minutes, then pour out and discard. With muzzle pointing downward insert the cleaning rod and gently push out the plug, taking care not to get any of the solution in the action. Then run a patch through from the breech to push remaining ammonia solution out of the bore. Now swab well with water, dry and grease. If not clean repeat the dose plus a wire brush to loosen it up. Never pour an ammonia solution in a warm barrel or it will rust instantly.

The slight metal fouling of gilding metal is not usually too troublesome. It is more of a tint than a substance and Hoppes #9 will remove it. In cases where it builds up, an ammonia solution is the quickest way out.

Leading is another form of metal fouling that requires different treatment. It is caused by lead or lead alloy bullets that for one of many causes leave a deposit of lead in the bore. A rough bore due to rust pits is constantly giving this trouble and the only cure is to discard it, if one of the .22 cal. rimfires. A brass wire brush and a good solvent will usually remove it. In more stubborn cases coat the bore with mercurial ointment and let stand a day or two, then use the brass brush again.

I have tried most of the powder solvents on the market and they seem to do the work they were intended for, which is removing residue. Some give a measure of temporary rust protection but are thin and soon dry out. I would not recommend any solvent for this purpose. It takes a high quality oil. Among some that I have

used that are reliable are Winchester, Remington, Savage, Ithaca gun oils, Nye oil and a polarized oil known as "Sheath." This latter is an inhibiting oil that penetrates moisture to the steel surface. It is free flowing and seems to give indefinite protection for me.

Another product that is worthy of special mention in this connection is an inhibitor called "Rig." It is neither an oil or a grease but a semi-fluid. At room temperatures it will penetrate fouling and seal itself to the steel. In use this semi-grease will protect a barrel fired with a corrosive primer for about three weeks. With non-corrosive primers the protection is indefinite. Simply smear on a patch, coat the bore and the job is done. But if you store your gun clean with hot water, coat with Rig and be safe.

A jointed cleaning rod is fine in a shooting kit but for home use a one-piece rod of stainless steel is tops. It is always set up ready for use and does not develop kinks when pressure is applied. It is easy to keep clean by just wiping with the patch when you are done with the bore. I have used such a cleaning rod with tip to match the bore for over twenty years. It looks good for that man more. Belding & Mull, Philipsburg, Pennsylvania, make these rods. Brass cleaning rods are a total loss in my book. They pick up grit and abrasives to scratch the bore. They develop kinks and are impractical to use with an ammonia solution. Commercial patches are best as they are cut to fit, are inexpensive and save time.

The last thing to remember for safety is to treat all ammunition as corrosive unless you know definitely that it is not.

. . . *The End*



# Hot Weather Care

By Herbert Kendrick

**W**HEN autumn turns the leaves and the harvest ripens, our thoughts are centered on our hunting dogs because that's the time for upland gunning. However, when the Master created this good ol' world of ours he planned four seasons: fall and winter for hunting, and spring and summer for fishing. When gunning days are over we return our dogs to the kennels, clean and oil our guns, then pack them away until another year. Far too often, I fear, we forget our dogs during the trying period of hot summer months, when a little care and attention would make his summer life more pleasant and healthy, making him a far more valuable animal when another hunting season opens.

A well-bred gun dog is a valuable asset and should certainly be well cared for every day of his life.

With the arrival of hot unpleasant days comes the usual swarms of insects and parasites to make your dog's life more of a "dog's life." These disease bearing plagues can cause serious sickness if they are allowed to go unchecked.

First of all the dog's house should be cleaned often, whitewashed, and supplied with cedar bedding. Cedar sawdust or shavings are a distinct discouragement to insects. The runways or yards around the dog house should be kept clean at all times, thus preventing the breeding of parasites.

If a dog is kept in a double-wired pen, where stray dogs cannot contact your own the insect problem will be kept to a minimum.



Dust your dogs frequently with a good reliable flea powder. This dusting will kill fleas, and lice, while a good spray used wisely and often will prevent flies and mosquitoes from irritating the dog. A word of caution here, however, if your dog has puppies be very careful to keep the powder and spray from the puppies' noses and the mother's breasts.

The next problem is that of heat for the dog *must* have shade at least during the heat of the day. Of course tree shade is best but if his quarters cannot be located near trees then artificial shade in the form of a roof or shelter must be provided for your canine friend.

One of the most important needs of summer is plenty of fresh cool water. A small pipe running from a house spigot down to the dog's water container is a handy way to keep him well supplied with minimum effort. If this arrangement cannot be made, supply each dog with a container that holds at least a gallon of water, and fill it at least twice every day.

An occasional dusting of air-slacked lime will keep the pen from becoming smelly and foul, and the water hose should be used to keep down dust during the dry season.

Bathing a dog during the summer months is not as necessary as many believe. If he is powdered and brushed, given proper food and sufficient fresh water and possesses general good health his coat will stay glossy and silky. One of the best ways to judge a dog's condition is by the looks of his hair.

The summer campaign for your dog should surely include exercise. This is a double problem because it



is too hot to allow the dog to run, and our laws prohibit it. Either let him swim at every opportunity or permit him to run around the yard in the cool of the evening while you watch him.

Summer diet for the dog should include more protein, less fats and carbohydrates. Less food will be needed in hot weather than in the cold winter months, when he is so much more active. First rate prepared foods on the market today greatly simplify our summer feeding problems.

Be certain food is not left in the pan to become spoiled and later eaten with a fresh supply. During

the summer it is better to feed twice each day, light in the morning and heavier in the evening. Do not overlook a chance to give him a good bone from the market, because it will help his teeth, and give him something to do during the long warm hours.

Spend all the time you can with your hunting partner during his "trying period." He will know and appreciate your friendliness and care and when the frost comes he will reward you with a superlative performance every time you take him afield.

. . . *The End*

#### FREE SHOOTING BOOKLET

Directed primarily to the youngster who is interested in having more fun with his 22 rifle, the Sporting Arms and Ammunition Institute has produced an illustrated booklet which is available free. The format is a combination of instructional text and colored cartoons, with the spice of comic treatment. Such subjects as What Not to Shoot, Shooting Games, Shooting Positions, A Safe Place to Shoot, Types of Targets, Indoor Shooting, How to Clean Your Rifle, The Ten Commandments of Safety are all explained in colored cartoons. Special emphasis is placed on safe gun handling. The purpose of the book is to impress upon the youngster the necessity for safe shooting practices and assist him in getting more pleasure out of his shooting practice. Copies may be secured free of charge by writing to the Advertising Department, Remington Arms Company, Inc., Bridgeport, Conn.

# Ammunition for the Bow

By Thomas A. Forbes

## PART II

LAST month our discussion ended with a description of the variety of pyles on the market. A similar situation exists with nocks. The arrow nock is the groove in the feathered end of the shaft into which the bow string is fitted. In a self arrow the nock is simply a longitudinal slot in the end of the shaft. The slot is always cut across the grain; Fig. 23 (a).

In event a soft wood is used to construct the shaft it was formerly the custom to splice a piece of hardwood to the end of the shaft and fit the nock in the hardwood splice.

Nocks offer another opportunity for endless experimentation to develop the material and shape best suited to the archer. The introduction of plastics of considerable strength and the ease with which it can be molded into any desired shape has resulted in its wide use as a nock material on both low and high priced arrows. The low cost of the plastic nock has eliminated the self nock in all but the very cheapest grade of arrows. These detachable nocks are fitted to the feathered end of the shaft in the same manner as the pyle and are easily replaced when broken. Nocks are made in a variety of shapes and each manufacturer claims certain advantages for his style of nock.

If you want to experiment to find a suitable nock, buy a dozen assorted nocks and try them out on your arrows. The retail price for the assort-



ment will amount to approximately fifty cents. With a sharp pen knife you can easily whittle the plastic nock from one of your arrows and substitute one of the others. With Duco Household Cement, which can be purchased in tubes at most five and dime stores, attach the new nock to your arrow. The cement sets quickly and the arrow can be shot in thirty minutes at the outside.

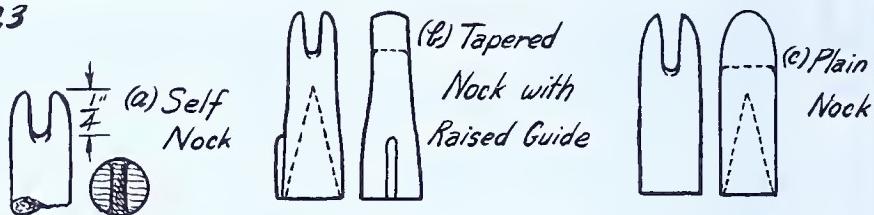
Since nocks are frequently broken, a little practice in replacing them will not be time wasted. Try out the assorted nocks on the range and choose the one that performs best for you.

The tapered nock, Figure 23 (b), has a raised ridge located at a right angle to the slotted portion of the nock which permits the archer to position the nock to receive the bow string by touch without determining the cock feather.

The feathers on the nock end of the shaft are called the fletching. To fletch means to fasten the feathers to the shaft. An arrow maker is known as a fletcher. Feathers from turkey wings are used, three feathers from the same wing of a turkey are used for each arrow. The cock feather (Figure 24) as it is called, is placed in position so that it is at a right angle to the nock and the remaining two feathers called hen feathers are spaced equally (120) one hundred and twenty degrees from the cock feather around the shaft approximately one inch from the bottom of the nock.

The cock feather generally differs in color from the two hen feathers and its distinctive color serves as a guide for positioning the bow string in the nock by sight.

Fig. 23



If you will study the fletching of an arrow you will see that this arrangement of the feathers offers the least resistance to the arrow as it moves past the bow at the beginning of its flight.

Feathers may be placed on the shaft so that their bases are parallel to the longitudinal axis or they may be placed on the shaft so that they make a slight spiral. In the latter position the arrow will revolve around its longitudinal axis in flight. Hunting arrows are generally made with spiral fletching to counteract the tendency of the broadhead to plane in flight; that is to have the wind pressure against the side of the broadhead force it from a straight line.

The fletching on target arrows is generally about three inches in length and one-half an inch in height, which is sufficient to maintain the arrow on the line of flight. The heavy broadhead used on the hunting arrow requires an increased amount of fletching to prevent it from dropping in flight at the pyle end due to the weight. In general the fletching will be approximately five and a half inches in length and five-eighths inches in height. The length is limited to the fistmele of the individual archer.

Bands painted on the arrow shaft below the fletching is called the crest. Custom made arrows are crested in accordance with the wishes of the archer. The crest permits easy identification of each arrow at the target.

The length of a target arrow, Figure 19 L, is measured from the bottom

of the nock to the base of the tip of the pyle. Hunting arrows are measured from the bottom of the nock to a point on the shaft ( $\frac{3}{4}$ ) three-quarters of an inch from the base of the broadhead. This additional distance or length is required to prevent injury to the fingers of the bow hand when the bow is brought full draw.

Many archers have adopted the practice of numbering their arrows consecutively. Each arrow can now be identified. If one arrow of the six shot into the target in one end consistently falls outside or wide of the group it can be identified by its number and if this happens repeatedly to the same arrow it is conclusive evidence that the arrow and not the archer is at fault. Should this situation occur in a match or tournament the quick identification of the bad arrow is identified the lower the score will suffer. There is therefore a distinct advantage in numbering your arrows for ready identification.

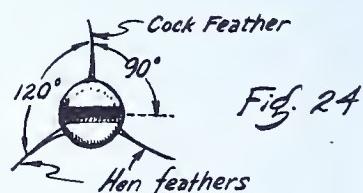


Fig. 24

In order that arrows lost and found after a lapse of time by another party on the range may be returned to their owner, archers frequently print their name in India ink (draftsman's ink) on the shaft below the crest. When the ink is thoroughly dry a light coat of varnish is applied to protect the ink from dampness.

. . . The End



### Berks County Federation

Says Game Protector J. A. Leieneker: "The Berks County Federated Sportsmen are offering a trophy to the member club that turns the greatest number of crow feet. This contest has developed quite a number of crow shooters. It is easy to find dead crows in most of our fields, but they are usually without feet. The North End Club of Reading is offering 3 shells for each pair of crow feet."

### Hellertown Sportsmen's Association

Organized sportsmen are quick to realize the value of youth education and conservation, and are cooperating with the schools and youth groups in instilling in our young people an appreciation of our wildlife and other natural resources.

One popular method is that of providing them with educational literature. Recently, on behalf of the Hellertown Sportsmen's Association, club president Freeman Smith presented eleven sets of the Pennsylvania Game Commission's new bird and mammal charts to schools in the Hellertown Borough and to the Boy Scout troops in the area. This commendable gesture could be profitably copied by sportsmen's organizations throughout the state.

### Fayette County Federation

In observance of National Wildlife Week the Fayette County Federation of Sportsmen's Clubs has purchased forty sets of Bird and Mammal Charts to be distributed to the schools of Fayette County. National Wildlife Week Chairman Les Secoy, Point Marion, announced.

These full color charts, were purchased from the Pennsylvania Game Commission through District Game Protector Tom Meehan, as part of the Federation's educational program in wildlife conservation. Secoy, also president of the Fayette group for 1952 stated. "We hope that they will be used to good advantage in our schools and provide an incentive to further study of our wildlife resources."

### Bedford County Federation

Game Protector John R. Hiller, of Hopewell, reports that last fall the Bedford County Federation of Sportsmen's Clubs had 10,000 safety zone signs printed to be distributed to farmers to post around their buildings.

Hiller said, "This move had a good sportsman-farmer relations aspect. As I drove over Bedford County last fall it was pleasant to see safety zone signs posted where previously there were no trespass signs.

"Most of the farmers are of the opinion that the safety zone signs provided them more protection from careless hunters than did no trespass signs," said Hiller, and he suggested: "Judging from what I observed, this would be a worthwhile project for sportsmen in all 67 counties to foster."

### Northampton Federation

A predator control contest was sponsored by the Northampton County Federation of Sportsmen's clubs, which began on September 1, 1950 and continued until June 31, 1951. Three prizes totaling \$100 dollars were awarded to the members re-

ceiving the highest number of points.

Elwood Savitz, Lower Mt. Bethel club won \$50 for his score of 561 points including 7 red and 27 grey foxes and 17 crows. Ralph Crozier, Easton club won \$30 for his score of 360 including 360 pair of crows feet, and Charles Deemer, Monocacy club won \$20 for his score of 304 including 19 foxes. Runner-up were Ralph Green, Petersville club 272 points; George Long, Bethlehem Township club, 239 points, and Louis Bartakovits, 208 points. In all 101 Foxes, 557 crows, 7 weasels and 7 water snakes were reported.

This years contest began September 1st and will end August 31, 1952. Points for red and grey fox, weasel, skunk, opossum, wild cat, crows, horned owl, goshawk, coopers hawk, water snakes, snapper turtle and crows eggs will be given in this years contest. Opossum, snappers, skunk, wild cats and crows eggs have been added to this years list of predators. Six awards totaling \$125 will be awarded.

Committee in charge are George Long, Bethlehem Township rod and gun club; Leo Gallagher, Freemansburg rod and gun club; and Paul Siegfried of the Easton Rod and Gun club.

#### Warren Field and Stream Club

The Warren Field and Stream Club, Warren, Pa., apparently believes Johnny Appleseed pioneered a worthwhile program.

This spring, the club distributed 500 packets containing three varieties of seeds of trees and shrubs that produce ideal wildlife habitat. Sportsmen receiving them were advised where and how to plant for best returns, and were warned to avoid planting in country over-run with deer.

The Warren organization is widely known for its vision and public spiritedness. Here again the Field and Stream Club shows the way by plant-

ing to increase later game populations through the development of the prime wildlife necessities, food and cover.



#### SHOW-OFF CUBS AND HUMAN TAUGHT LESSON BY MOTHER BEAR

Game Protector Norman Erickson, Eporium, reported this recent interesting occurrence: Returning to his headquarter about 2:00 p. m., the officer saw a group of people on the road ahead looking excitedly down the mountain near How Siding. In curiosity, Erickson added presence. What he, too, saw were three little cubs playing in a small maple tree. In 45 minutes they performed they drew a large number of spectators, some of whom took "ringside seats" near the tree while others photographed the little clowns close-up.

Then Mother Bear—weight about 2 pounds—peered over a log about 35 yards away. She gave the people at the top a cold, unappreciative look and headed straight for them. They quickly scrambled back to safer positions on the road.

By this time the cubs were pretty well down out of the tree. In a matter of seconds Mother Bear had scolded and cuffed the young exhibitionists down the hill and out of sight into the forest.

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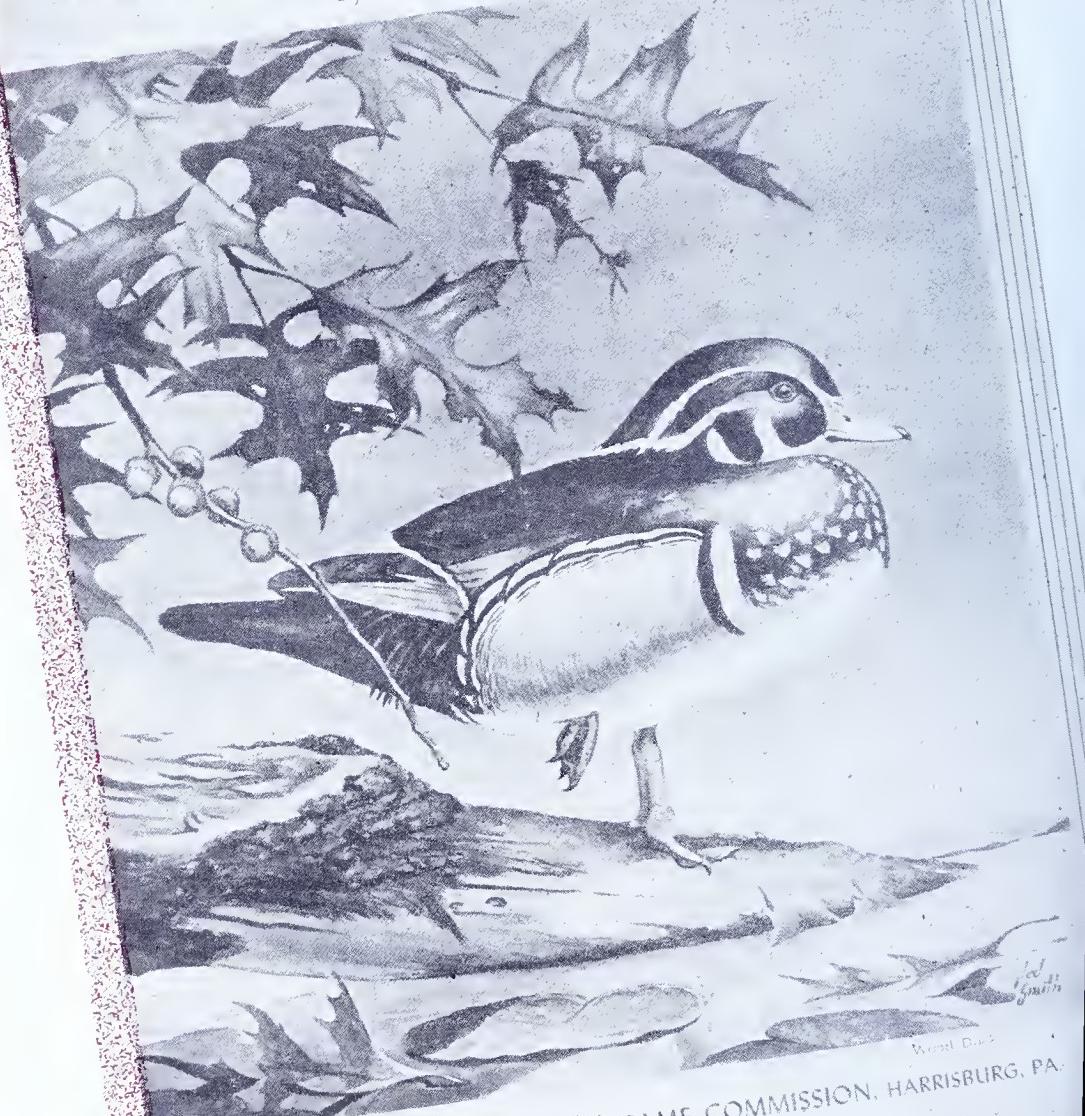
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PENNSYLVANIA

# Game News

PENNSYLVANIA STATE GAME COMMISSION



Pg. 34

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JULY 1952

10 CENTS



# THE STORY BEHIND THE COVER

**A**S any woodchuck hunter will tell you, the cover photograph on this issue is pure, unadulterated deception. The model's air of childlike innocence is assumed only for photographers; the appearance of a gun in the scene would result in the immediate disappearance of our photogenic friend.

No other Pennsylvania mammal can be so exasperatingly difficult to approach. The groundhog, as he is commonly called, has splendid eyesight and is constantly employing it. Upon leaving his burrow he usually scans the countryside for some time before fully emerging. He constantly interrupts his feeding to assume the well-known upright "observation" stance. A little that moves escapes his notice.

The fact is, Mr. Groundhog is so all-fired wary that he is in a large part responsible for the development of a comparatively new type firearm, the "wildcat" rifle. As explained in the article on page 24 wildcat rifles are those built by private gunsmiths for ammunition designed by individual gun cranks. As a rule this ammunition is extremely "hot," giving the flat trajectory and super accuracy so necessary for long range varmint shooting. And for long range work it is—200 yard shots are run-of-the-mill and longer ones are not uncommon.

The groundhog has transformed many a mediocre hunter into an exceptionally good marksman. He is to the present day hunter what the gray squirrel was to our frontier riflemen of Colonial days, the most accessible and abundant game animal on which to sharpen the shooting eye. Like the squirrel he is also good to eat, although there seems to be a difference of opinion among hunters and their families on this score.

Another important role played by the 'chuck is that of providing shelter for other game and furbearers. No better home for skunks, opossums, etc., can be found than a cozy groundhog burrow, and Brer Rabbit utilizes these holes both as protection from the elements and as refuges from the eagle-houn' dog or predator.

Of course, when cultivated fields are selected for these excavations the farmer is apt to register a complaint—and he has a perfect right to do so. But that's why hunters love to hunt the little grizzled burrower. There is precious little land posted against *groundhog* hunting.

# PENNSYLVANIA *Game News*

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Commonwealth of Pennsylvania

JOHN S. FINE, GOVERNOR



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VACATION time is again in full swing, and pleasure-seeking tourists are rolling along the Country's highways. In Pennsylvania we see cars from every state, Canada and Mexico, while oddly enough, our own tourists race far afield to chosen vacation spots in the Rockies, New England, Canada, the Sunny Southland, or somewhere abroad. What surprisingly few residents of the Keystone State realize is that various state and federal departments provide innumerable recreational facilities right here in Pennsylvania.

Do you like picnicking, hiking, camping, swimming or boating? Or would you prefer fishing, hunting or horseback riding? After the hunting season do your thoughts turn to winter sports? Then you should consider the state and nationally-owned lands that give you all these, and other outdoor pleasures.

For instance, the more than thirty State Parks supervised by the Pennsylvania Department of Forests and Waters provide for all types of recreation in unparalleled woodland settings. A local friend whose travels had taken him to the scenic wonderlands of the West, from the Grand Canyon to the Canadian Rockies, recently made his first trip to a Pennsylvania State Park. His delight knew no bounds; it was clearly a "Where have I been all my life" attitude.

This same department supervises approximately 1,700,000 acres of State Forests, which are for the most part open to public hunting, fishing and camping. Together with the parks, they contain more than 3,000 miles of good roads, 4,000 miles of clearly marked trails and some of the state's most outstanding scenic vistas.

The Pennsylvania Game Commission furnishes free public hunting and fishing through the acquisition of more than 880,000 acres of land called State Game Lands. 198 in number, these tracts are located in woodland areas in practically all parts of the state, so that Commonwealth sportsmen shall have ready access to the best in gunning and angling. Nearly a million acres of Farm-Game projects provide public hunting through a co-operative plan approved by both farmer and Game Commission. Fish hatcheries maintained by the Pennsylvania Fish Commission keep the state's streams and lakes well stocked with scrappy game and pan fish in spite of the heavy annual "take."

National Parks such as Valley Forge and Gettysburg are among the nation's most revered and historical spots and furnished an attraction found nowhere else. Allegheny National Forest, offers one half million acres in northeastern Pennsylvania for the free use of lovers of the outdoors.

So if you're in search of outdoor recreation or scenic beauty any time of the year, remember that the Keystone State is yours to use and enjoy. Don't be just another vacationist who can't see the forest for the trees.

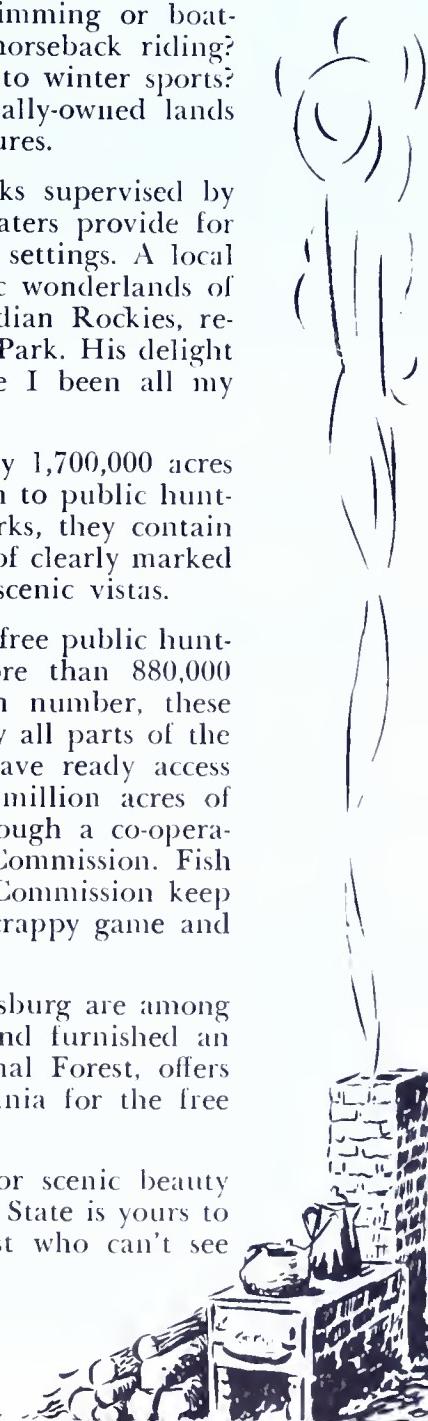




Photo by the author

Seven field trips were included in the conservation course. Here students inspect a reforestation plantation owned by Chester Allen, Warren.

# Readin', Writin' and Conservation

By Grace O. Beach

*Editors Note: Last February the Warren County Council of Sportsmen's Clubs was awarded the trophy of the Pennsylvania Federation of Sportsmen's Clubs for having contributed the most to the field of Conservation. The Warren Field and Stream Club is the largest member group.*

**P**RIDE and satisfaction is the reward for accomplishment. That is the stuff on which America was built and has been her springboard of progress. When an ideal for which you have long labored begins to take tangible form, it is bound to bring about a reaction. The smile flashes a little brighter, the chin lifts a little higher, the shoulders straighten perceptibly and the steps grow a little springier.

The members of the Warren Field and Stream Club must be experienc-

ing these reactions. They had several ideals for which they worked. One of these was a conservation course in their high school curriculum. This past year, they saw it come to life in an active reality. They nurtured it carefully, and piloted it successfully through its first pioneering milestone.

We learned about this course early last fall in its initial stage. It was determined then to follow through at the close of the term and get the full story, experiences and results of

his new effort, the first elective and accredited conservation course in the state, so far as we know.

The author, just one among the hundreds of other conservationists interested in this same ideal, argued that others working as they were and striving for the same objective throughout the state and across the nation, could benefit from their course of action, their experiences, and results obtained so far. This information can be of considerable help and importance and a valuable contribution to the whole program. They agreed to an interview and later in April we journeyed to Warren, Pennsylvania to meet with those concerned in carrying out the project.

Our first move had been to contact Mr. Richard Costley, Supervisor of the Allegheny National Forest, who is also a member of the Warren Field and Stream Club and who was appointed by Mr. Donald Taft, then President of the Club to act as Chairman of the Central Advisory Committee for the Program. Mr. Costley arranged the meeting, met us on our arrival and directed us to the school.

Present at the meeting held in the Board Room was Mr. Floyd Bathurst, Principal of the School; J. H. Reddecliff, the Instructor for the course; and the Advisory Committee comprising; Donald Taft, Past President of the Warren Field and Stream Club; Steve Tritt, State Agricultural Extension Service; Ted Sponsler, Vocational Agricultural Instruction; Ralph Eckert, Soil Conservation Service; A. H. Vogler, Pennsylvania Department of Forests and Waters; Hon. F. M. Greer, Member of the Sanitary Water Board; Ross Bailey, Pennsylvania Fish Commission; David Titus, Pennsylvania Game Commission and Richard Costley the Chairman of the Committee, all of which are also members of the Warren Field and Stream Club.

As can be seen this is a fully representative group of all the Conserva-

tion Agencies in the State, well trained in their field and well versed in conservation generally. You are not in their presence long before you realize that they are all conservation minded far above and beyond their field and the call of duty. This seems to be true generally of all professional conservationists.

The idea for formulating the conservation course seemed to germinate at one of the club's Directors meetings held at the local YMCA, when during the meeting three boys from the High School appealed to the Board to help revitalize the Junior Conservation Club that had previously been organized and sponsored by the Warren Field and Stream Club at the Warren High School. This conservation club had become inactive, probably because the members had graduated, for such a club would lose many members yearly and new ones would constantly have to be brought in to keep the club going. This type of organization is always difficult to keep activated.

Originally, the conservation club sessions had been held after school hours and the meetings were about an hour's duration. They had taken the form of a class rather than a social club session. Beside the discussions held, there were also classes in fly tying and other practical and recreational benefits. These participation classes probably had a greater degree of attraction than the fundamental and basic meaning of conservation, the Board suspected, although they could not be sure this was the case.

The members discussed the problem pro and con and the more they went over the various points the more the idea grew that what was really the best answer was a course in conservation. This would be perpetual and have a planned presentation, not a hit or miss, piece-meal sort of affair. After all, the original idea

had been the teaching of conservation in the school. Why not take a plunge and see what could be done about getting a real course started? That night, the Central Advisory Committee was appointed to work out a program for such a course.

The Committee went to work. They drew up tentative plans and a program of subjects to be covered during an 18 week period that makes up a semester, or 90 classes in all. A list was made up of all the local, state and National conservation agencies that might be solicited for help. Each agency or organization, was contacted either personally or by letter. They all gave of their experience and knowledge and supplied available material that might be used in such a course.

As the material came in it was gone over carefully and classified, evaluated and correlated. Those media contributing the best general and specific information were chosen as the educational material to be used for the course. When the plans were complete they were presented to the Principal of the High School, Mr. Bathurst, and then to the School Board. Being conservation minded and progressive in attitude, they agreed to give the course a trial—a highly commendable decision.

Mr. Reddecliff, who is a very conservation minded history teacher was appointed to teach the class. In approaching an entirely new course with no text book for guidance and no previous special training other than personal interest and experience in the subject, Mr. Reddecliff felt some trepidation at the immensity of the task, as any teacher must in like position. It was natural that he would desire as great a foundation as he could acquire and he expressed a desire to attend the Teachers Conservation Course at State College. The Warren Field and Stream Club sponsored and paid his expenses to

attend the course as a part of the contribution to this project.

To help the class to get off to good start the members of the club and the committee elected to take an active interest in the course. They planned to do everything possible in its support and in helping to build up the classroom material, as well as assist in conducting the course, in so far as desired by the school and the Instructor.

All media and plans were passed on by Mr. Gerald Newton, the Curriculum Director for the Warren Board of Public Education, the Principal, Mr. Bathurst and the School Board. The course was to run for a full semester, it was elective and carried one-half unit credit.

The overall planning policy of the committee was essentially an effort to steer classroom material away from a hunting and fishing circus or rodeo into a more general foundation of the basic elements of conservation problems. Accordingly, in laying the foundation for the course and selecting the material they started with first things first, the soil. The course was designed to bring to the student a basic understanding of soil values and how necessary they were before it is possible to have vegetation (including forests) and a stable flow of pure clean water. Then upon a foundation knowledge of plant and water relationship and their dependence on the right kind of soil conditions, the course took up productivity, wildlife habitat, eventually developing the realization that there can be no good hunting and fishing only if attention is given to the soil, food and cover and water factors of the equation we must take care of first.

The wisdom of the broad-vision policy can be readily determined from the results of the self-evaluation tests indicating that the students agreed this to be the most productive approach.

The special publications initially chosen for and used during the course were *Natural Principles of Land Use* by E. H. Graham, published by Oxford University Press; *Deserts on the March* by Paul B. Sears, University of Oklahoma Press; *Road to Survival* by William Vogt,

School Administrators; *A Conservation Handbook* by Samuel Ordway, Jr., of the Conservation Foundation. Other conservation materials put out by the several state and federal conservation agencies were also used.

Among the conservation organizations consulted and who contributed

*Merrill Lillie (center) superintendent of the State Fish Hatchery at Corry, explains fish caring methods to Warren High School students.*



William Sloan Associates, Inc.; *Our Plundered Planet* by Fairfield Osborn, Little, Brown & Company; *A Sand County Almanac* by Aldo Leopold, Oxford University Press; *Wildlife Management*, Ira N. Gabrielson, MacMillan Company; *Trout Streams* by Paul R. Needham, Comstock Publishing Company; *Conservation in the United States* by A. F. Gustafson, et al., Comstock Publishing Company; *Soil, Grasses, and Trees*, U. S. Department of Agriculture Yearbooks; Twenty-ninth Yearbook of the American Association of

Photo by the author

their help and available material were the Conservation Foundation of the American Museum of Natural History of New York; National Wildlife Federation, Washington, D. C.; Wilderness Society, Washington, D. C.; Wildlife Management Institute, Washington, D. C.; National Parks Association, Washington, D. C.; The American Forestry Society, Washington, D. C.; Izaak Walton League of America, Chicago, Illinois; American Forest Product Industries, Washington, D. C.; The American Nature

Society, New York, N. Y.; The National Audubon Society, New York, N. Y.; Sports Fishing Institute, Washington, D. C.; Soil Conservation Society, Washington, D. C.; and the Wildlife Society, Washington, D. C.

Last fall with the opening of school, twenty-eight boys elected to take the course and the class got under way on its initial test.

The first two opening sessions were panel discussions. The panel was made up of the local heads of the various conservation agencies all represented on the Central Advisory Committee. Each man introduced himself and gave a brief outline of the work done by the agency with which he was affiliated. They went into the work they did; the policies they followed; the fundamental principles involved as well as how the work of each agency tied in with the other agencies in the overall conservation picture.

These discussions gave the students a chance to meet the local head of each agency, hear him discuss his work and what his particular effort meant in the conservation field. In this manner, they became familiar with the various conservation services and the men with whom they would later have more direct contact in participation in the course of study and on field trips.

The next step was the working outlines for the different major subjects. This was drawn up by the pupils and the teacher, working together. From the knowledge they had gained during the panel sessions the students expressed an interest in delving further into certain specific subjects. These expressions were noted and outlined. From the outline the teacher drew up the final work schedule, which was applied to all subjects throughout the course. The outline used in the field of forestry was as follows:

The class was divided into two groups for greater ease in handling

and they were given certain assignments. Each individual group went out as a group, investigated and completed their assignments and reported back on their findings and observations.

Films were shown to the class from time to time on all the various phases of conservation. Probably the most effective were "The Living Earth" and "The Living Forest" series prepared by the Conservation Foundation and distributed by the Encyclopedia Britannica.

Seven field trips were taken. These trips averaged two or three hours per trip, depending upon the subject to be studied. The head of the conservation agency involved went along on these trips to give full particulars and to answer the questions brought up during the field trip. The overtime above regular class hours was not deductible, but was made up later. These trips were financed by the Warren Field and Stream Club and they were very important to the class, for by seeing actual instances it added interest and fiber to the course.

During the course and before hunting season a very excellent Conservation Safety Program was put on by these students for the High School Assembly. It went over big and was then taken into the grades. In the opinion of those concerned the success of this program was due to the fact that it was put on by students for students which gave it greater interest appeal than if it had been put on by experts.

It was most interesting to learn that out of the twenty-eight students taking the course; three expressed desire to go into conservation work, two being interested in taking up forestry work and one the wildlife field. Another student was extremely interested in Sanitary Engineering and discussed it at quite some length with committeeman Greer, who is the member of the Sanitary Water

Board. Since there were 19 members of the class in their senior year and in all probability had already more or less settled on the vocation they desired to follow, this would seem a very high percent of individual interest in the conservation field as a profession, on the part of the students. It also points out the interest in such a course and the excellence with which it was given.

The final session of the course was another panel session of the Committee. During this session, they went into the Civic and Vocational attributes of this work and the job possibilities in all these various fields of conservation.

There were no final exams, but an evaluation test was given. The results of this test were most interesting. The answers to some of the more important questions, we think, will be of as much interest to our readers as they were to the writer, so we are including the most important.

The first question asked why they enrolled in the course? Twenty-four joined because they liked to hunt and fish; four, because the school suggested it; one, because he wanted to be with a friend.

The second was a query as to what they expected from the course when they enrolled? Eight thought they would spend more time on hunting and fishing than they did; two thought it would give more field trips; 22 thought it would require more study than was involved, and 20 thought the course would be less interesting than it has been.

Another question asked if they were more interested in conservation since taking the course, or whether it hadn't changed their ideas? Every student in the class went on record as being more interested in the subject.

When asked which unit of conservation they enjoyed most, the answers stacked up as follows: Thirteen students found soils and agronomy

of most interest; fish and fishing was of most interest to one student and fourteen found wildlife, other than fish, of most interest.

To the question of which unit of conservation they thought most important; thirteen voted for soil; eight for forests; five for water and two for wildlife.

When asked what class instruction they liked best; sixteen students liked the visiting conservationist best; nine liked the field trips best and four liked the movies best.

The answers to the question "since taking the conservation course, do you think it should be taught in a special course such as was done; worked into other classes as part of them; or, both of the above," brought twenty-six votes for a special course and four for both.

Students were asked whether or not they thought future conservation classes should be dropped; required of all students; or carried as an elective subject? Twenty-five thought it should be an elective course, and five were for a required course.

The next interesting question dealt with what units they had learned most about. That brought out the fact that seven had learned most about soils; twelve about forests; four about water; three about fish; and three about wildlife.

The final question on which we will report asked: "Knowing what you do now, would you recommend that your friends take the course, or not?" Every student said they would recommend taking the course.

The other questions which we will not cover, were the right or wrong choice type of question dealing with various units of conservation.

At this point, we were interested in knowing if, in the light of their experience and with the net results as a background, the school planned to continue the course. They assured the writer they not only intended carrying it on as originally set up,

but also considered enlarging the program.

Upon the completion of the student class registration, which was in progress at the time of the meeting, the writer received a letter containing information which brought a warm glow of satisfaction, as it certainly must have to those who have worked on this project. Enough students elected to take the conservation course to constitute three classes. Of unusual interest was the fact that several of the registrants were girls. The writer has long contended that good conservation is just as important to women as men, and that they should be equally concerned in attaining the same end results and ideals.

Conservation is taught generally through the Warren schools, inculcated with the history, sciences and other subjects and by talks given to the students at various times by the local heads of the various conservation agencies and members of the Warren Field and Stream Club. This conservation course is in addition to the more generalized teachings.

The author would like to point out that conservation, is after all, the fundamental basis of all education. At present human conservation is taught the pupil from the first grade through the entire school, for through physiology and the social sciences they learn the care of the eyes and teeth, proper diet for good health, good hygenic habits and various related subjects and their relation to life. Conservation of natural resources, which are the base upon which these fundamentals are founded, should be a part of the child's training.

For example, if we teach proper diet then the soil must play a part in growing that food. Water is equally as important, for the food we eat and our bodies all contain a high percentage of water, and moisture is necessary to plant growth.

In the study of Geography, the supply of natural resources has been the greatest determining factor of man's settlement and life in almost any given area. The strength and stability of the people in the area rise and fall with the available supply.

History is first and foremost the story of the waste and destruction of our natural resources. New lands were opened by pioneers in their search for better supplies and better living. Almost every war throughout the history of the world was fundamentally fought for greater sources of supplies. Ancient History is paved with nations who have fallen to the conqueror or disappeared from the face of the earth due to land mismanagement and lack of sufficient supply to maintain the population.

There is not a single subject taught in the schools today that does not have some direct connection with our natural resources, nor to which the science of conservation could not be brought.

Let me ask you, the reader, this question: "What good will it do to educate our children to be able to do mathematics, to speak good English, to learn a profession, if they have no water and minerals to produce food, water to drink and supply moisture to plant life, or the myriad of insects, birds and animal life that provide the proper balance.

Not one of those subjects will be of the least benefit when the natural resources are gone and no money in the bank will buy them back.

Conservation of our natural resources should be added to conservation of human resources in our educational scheme.

Here in this article is the ground work, and the information with which you can work on a similar basis, in your own area. It is hoped that we have given you that spark that will challenge you to go and do likewise.

. . . *The End*

# *The Black Bear In Pennsylvania*

A "Game News" Conservation Education Pamphlet

Pennsylvania Game Commission

Harrisburg, Pa.



PGC Phot

*In Pennsylvania most bears spend the winter months hibernating in some protected spot. At this time the female gives birth to her half pound infants.*

## The Black Bear in Pennsylvania

NOT many persons associate the black bear with a state so thickly populated and industrial as the Keystone State. Perhaps this is because Pennsylvania's whitetailed deer have received so much more publicity, and the bear has been forced to take a back seat. It is not remarkable that Pennsylvania should support such a large population of bears. More than five million acres of forest land in the state provide some of the finest bear country that can be found. Vast ridges, marvelous in their wild beauty and ruggedness, offer many a haven for bears.

Things were not always so accommodating for bruin and his tribe. The coming of the white man spelled

disaster for bears and other wildlife. Man needed game for food, and at first killed only what he could actually use. As communities developed, however, he sensed more profitable outlets for the creatures that he killed. As towns grew, markets were established, and game was bought and sold along with grain and vegetables. Bruin suffered with the rest, and by 1895, when the Game Commission was established, black bears were very scarce in Pennsylvania. Nevertheless they were accorded no protection until 1905, when a closed season was established and shooting permitted only from October 1 to March 1. Thus Pennsylvania was the first state to enact

legislation protecting black bears, and without this wise action there probably would be no bear hunting in the state today. Although including them on the protected list of game animals, the same act also permitted them to be killed when destroying personal property or attacking human beings.

The same law is in force at the present time. However, penalties for violations have been increased from fifty dollars to two hundred dollars. There is also a law prohibiting the taking of bears through the use of any vehicle or artificial light. In addition, all equipment, including cars or trailers, used in conjunction with the illegal killing of such big game by means of artificial light may be confiscated.

One bad feature permitted under the law of 1905 was the use of the steel trap and the deadfall, but in 1911 an act of the legislature abolished the use of both of these dangerous contrivances. Not only were they deemed unnecessarily cruel, but on more than one occasion hunters were badly injured when they unknowingly stepped into a deadfall or large steel-jawed trap.

The law of 1909 reduced the length of the open season to three months, October 1 to January 1. By 1912 bears had increased considerably, and the hunter began regarding them as prize game animals! He accordingly demanded additional protection for bruin, with the result that the Legislature of 1915 reduced the open season to two months, October 15 to December 15, prohibited the use of log pens in taking bears, and established a bag limit of one bear to each hunter. In 1917 a law was passed establishing a limit of three bears for each camp or hunting party.

By 1919 the animals had increased to such an extent in some counties that numerous complaints of the destruction of sheep and beehives were

heard. As a result the Legislature gave the Game Commission authority to provide special rules and regulations concerning the taking of bears, upon petition of two hundred citizens, in counties where conditions would warrant such action.

A law was enacted in 1921 prohibiting the use of any ammunition except a single bullet in killing bears; it also reduced the season to one and a half months, November 1 to December 15.

As the years passed the animals became more numerous, and in 1923 the bag limit for camps and hunting parties was increased from three to four. In 1925 the season was changed to the period from November 10 to December 15; but in 1929, under the Commission's power to change seasons and bag limits, it was again changed to November 1 to December 15. The law of 1925 also provided that only bears over a year old could legally be taken, thus giving much needed protection to cubs. This regulation is still in effect. In 1935 it became illegal to use dogs in hunting or chasing bears.

Proof of the increase of bears and their desirability as game animals can best be gained by reviewing the annual bag of these creatures over a period of years as set forth in the table below.

#### KILL OF BEARS

1915	188	1934	(Closed)
1916	435	1935	402
1917	368	1936	356
1918	387	1937	537
1919	472	1938	384
1920	420	1939	535
1921	510	1940	524
1922	563	1941	593
1923	500	1942	149
1924	929	1943	307
1925	470	1944	295
1926	660	1945	366
1927	321	1946	325
1928	427	1947	569
1929	447	1948	388
1930	707	1949	411
1931	501	1950	354
1932	216	1951	492
	586		



Photo by courtesy of GRIT

*True to his curious nature this bear examines the camp woodpile.*

It can readily be seen from the figures in the table that bruin has held his own. The kill varies considerably during certain seasons. Sometimes bad weather confronts the hunter for several days of the open seasons. At other times bruin is forced to hibernate earlier than usual. Some years the animals are widely scattered because of the scarcity of food.

As they became destructive in certain sections, bears were live trapped and removed to more desirable locations. Through such restocking activities they again became common in regions where they had been exterminated forty years before.

Bears are often a nuisance after emerging from hibernation, especially if enough natural food is not handy. Individuals will sometimes destroy whole apiaries and even kill livestock. These marauders some-

times have to be killed. As a result of bruin's depredations, the Game Commission pays landowners for damage done by the animals. By law an appropriation of \$5,000 is set aside for this purpose every year. The number of claims submitted, the number of animals involved, and the amount paid since the bear damage law was passed are as follows:

#### BEAR DAMAGE CLAIMS, 1925-50 INCLUSIVE

Year	No. Claims	No. Animals and Beehives	Amount
1925-26	72	320	\$3,313.50
1927-28	137	395	4,739.54
1929-30	197	602	5,997.75
1931-32	161	561	5,353.46
1933-34	58	144	7,059.30
1935-36	116	342	2,568.94
1937-38	86	203	7,621.50
1939-40	100	322	1,647.57
1941-42	94	216	1,757.47
1943-44	166	439	4,411.90
1945-46	180	460	5,086.20
1947-48	203	535	7,065.99
1949-50	104	45*	3,139.47

\* Beehives not included.

The livestock killing habit of some bears cannot be blamed on the tribe generally. It is entirely an individual characteristic. Sometimes it is brought about because of a scarcity of natural food, or by some farmer failing to bury the carcass of an animal which died. When one has acquired this destructive trait, that bear must be eliminated.

During food shortages bears wander widely, and occasionally come down into towns where they cause much consternation. Black bears seldom attack or harm anyone. Occasionally a field officer will write in and tell us about some unusual report or observation he has received about bears. Here is a typical example.

"While at my desk one afternoon, taking care of some official correspondence, I answered the telephone to hear an excited woman's voice

ay, 'Two bears have my sons up an  
apple tree in the orchard. What can  
do, I'm here all alone!'

"I knew this woman's sons were  
in no danger so long as they stayed  
in the tree. So I said, 'If you have  
a gun and can shoot it, just fire a  
couple of shots and scare the bears  
away. I'll come over as quickly as  
possible.'

"I reached the home in about fifteen  
minutes and found the boys in  
the house. They told me the follow-  
ing story: In picking apples they  
had climbed a tree to shake down the  
remaining fruit. While thus em-  
ployed, they were much surprised to  
see a small cub waddle under the  
tree and start eating the apples. They  
had quite a time throwing more  
apples to the little fellow, until an

old bear joined in the free lunch.  
Then the boys' mother discovered  
the situation and you know the  
rest . . ."

Within three blocks of the central  
part of Williamsport, one of the  
largest cities in the mountainous  
northcentral part of the State, as  
many as six bears have been seen  
at one time. They explore the fringes  
of the city, where they ruin many  
fruit trees and upset many garbage  
cans . . .

In another county a farmer who  
stored his honey in the kitchen was  
awakened one night by a great racket.  
Upon investigation he found  
that three large bears had pushed

*Game Commission employees dragging a  
live trap into place to capture an "outlaw"  
bear.*



the door open and were eating the honey. To get it, they had wrecked a lot of furniture and broken many dishes . . .

A lady living near a large town was horrified when she looked from

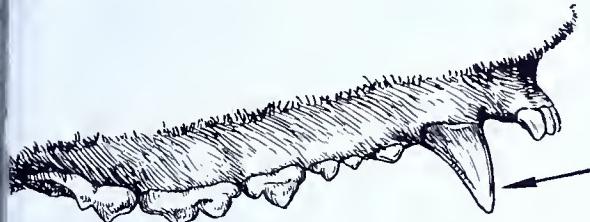
her bedroom one night and saw a large bear sharpening its claws on a tree near the window . . .

In a neighboring county a farmer and his wife went to the fields to husk corn, but to their amazement

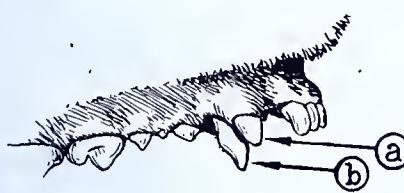


Photo by Bruce Studio

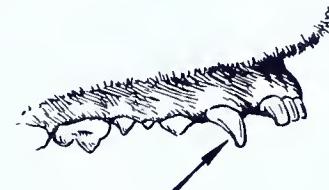
Many Keystone State hunters say there's no thrill like bringing down a man-sized black bear. C. D. Carper, Tyrone, who bagged this 302 pound bruin will heartily agree.

**LEGAL ADULT BEAR**

Permanent canine teeth, or "tusks", are fully formed and at least an inch in length. As a rule they are stained around the base.

**ILLEGAL CUB BEAR**

The permanent canine tooth (a), only partially exposed, is forcing the "milk" canine tooth (b) out of the gum.

**ILLEGAL BEAR CUB**

No sign of a permanent canine tooth. The small "milk" canine tooth is still in place.

**IDENTIFICATION OF BEAR CUBS**

discovered a large black bear calmly engaged in eating ears from one of the shocks. The animal scampered off when the farmer and his wife appeared. Later in the day a woman from the same vicinity, while returning from the store, was suddenly confronted by the same animal. She turned and ran. So did the bear, but in the opposite direction. It was difficult to tell who was more frightened — who ran the faster . . .

A few miles from another large town a school teacher looked out of the window and discovered two large ears playing on the school lawn. When the pupils arrived, the animals ambled leisurely away.

Many other interesting and amusing incidents have occurred. Despite all the furore they cause, bears seldom attack except in defense of their young or when badly wounded and cornered. This does not mean that the animals should be teased or aggravated.

Bears are desirable in Pennsylvania, not only because they furnish much sport for the hunter and

naturally, but because of the occasional thrill they give the nature lover. Hundreds of people travel the highways through bear country in the hope of catching a glimpse of bruin in his natural surroundings. Sometimes they are rewarded.

Every now and then a cinnamon bear, which is nothing more than a color phase of the black bear, has been killed in Pennsylvania. For the most part, these specimens have been taken within a very restricted area including parts of Potter, Clinton, and Lycoming Counties.

Cub black bears are born while the mother is hibernating, usually sometime in January. They weigh between one-half and three-quarters of a pound at birth and are blind and nearly naked. During the period from the birth of her cubs until she ends her long winter's sleep in the spring, the mother bear does little more than stir occasionally and must be surprised to find that she has acquired a family when she finally awakens. The stores of fat she has amassed during the previous fall

provide the material for the manufacture of milk throughout the winter.

At about six weeks the cubs open their eyes, and will weigh about five pounds when the mother leaves the den. By hunting season in November, these offspring will weigh about 60 to 70 pounds.

Bears breed during June and July and have a gestation period of about seven and one-half months. They breed first at the age of three, and will only breed every other year thereafter if her cubs remain with her during the first summer. Bears are known to live twenty-five years or more.

They can climb trees easily, and can balance perfectly on slender branches. They will regularly climb to secure apples, acorns, Juneberries and other fruits and nuts. Although bears see poorly except at close range, their senses of smell and hearing are very acute.

To the sportsman of Pennsylvania the black bear ranks with the wild turkey as a prize trophy of the hunt. Certainly these shy though clever animals, so often called the "clowns of the woods" merit all the protection we can give them. Pennsylvania can be proud that it was the first state to provide legislation for the protection of this grand game animal.

### SEASONS AND BAG LIMITS

1915	1 per season .....	October 15 - December 15
1917	1 per season, 3 a camp .....	October 15 - December 15
1919	1 per season, 3 a camp .....	October 15 - December 15
1921	1 per season, 3 a camp .....	November 1 - December 15
1923	1 per season, 4 a camp .....	November 1 - December 15
1925	1 per season, 4 a camp (cubs protected) .....	November 10 - December 15
1927	1 per season, 4 a camp .....	November 16 - December 15
1928	1 per season, 4 a camp (Thursday, Friday & Saturday of each week) .....	November 1 - November 30
	(Six days a week) .....	December 1 - December 15
1929	1 per season, 4 a camp .....	November 1 - December 15
1930	1 per season, 4 a camp .....	November 1 - December 15
1931	1 per season, 4 a camp .....	November 10 - December 15
1932	1 per season, 3 a camp .....	November 10 - November 30
1933	1 per season, 3 a camp .....	November 10 - November 30
1934	No open season .....	
1935	1 per season, 1 a camp .....	December 5, 6, 7
1936	1 per season, 1 a day .....	November 23 - November 26
1937	1 per season, 1 a day .....	November 15 - November 20
1938	1 per season, 1 a day .....	November 14 - November 19 (Parties 2 a day, and 2 a season)
1939	1 per season, 1 a day .....	November 15 - November 18 (Parties 5 or more 2 a day, and 2 a season)
1940	1 per season, 1 a day .....	November 18 - November 21 (Parties 5 or more 2 a day, and 2 a season)
1941	1 per season, 2 a camp (bear over 1 yr.) .....	November 19 - November 22
1942	1 per person, 2 a camp (bear over 1 yr.) .....	November 18 - November 21
1943	1 per season, 2 a camp (bear over 1 yr.) .....	November 15 - November 20
1944	1 per season, 2 a camp (bear over 1 yr.) .....	November 27 - November 30
1945	1 per season, 2 a camp (bear over 1 yr.) .....	November 26 - November 29
1946	1 per season, 2 a camp (bear over 1 yr.) .....	November 18 - November 23
1947	1 per season, 2 a camp (bear over 1 yr.) .....	November 17 - November 22
1948	1 per season, 2 a camp (bear over 1 yr.) .....	November 15 - November 20
1949	1 per season, 2 a camp (bear over 1 yr.) .....	November 14 - November 19
1950	1 per season, 2 a camp (bear over 1 yr.) .....	November 13 - November 18
1951	1 per season, 2 a camp (bear over 1 yr.) .....	November 19 - November 24

Note: In cases where the years are not listed, regulations for those years were the same as previous years.

. . . The End

# History of the Game Laws of England

By Nicholas Biddle  
Game Commissioner



THE idea of this article was suggested by an old book given to me by Leo Luttringer, Jr., Chief of our Conservation Education Division. The book is entitled "*The Laws Concerning Game*," written by William Nelson of the Middle-Temple, Esq., and was printed in London in 1753.

The preface of the book reads as follows:

"As ignorance of the Law excuseth no man \*Ignorantia joins non-excusat, therefore it is absolutely necessary for every Person to be well acquainted with the Laws of England concerning the Game; for there are scarce any Laws of this Kingdom that require to be more universally known; all Ranks from the Peer to the Peasant, not being exempted from Punishment for the Breach of them; or which Account the Revisor of this Edition has endeavored to shew what is accounted Game in the Eye of the Law, their Proceeds and seasons of Hunting, etc. what are the proper Receptacles for the Same; what Officers peculiarly belong to such Receptacles; the Manner of Choosing or Appointing them, their Oaths and Duties in their respective Posts,

and how far their Power and Authority extends; who shall be accounted Offenders; to whom it belongs to punish such Offenders, and how and in what Manner to proceed against and punish them, either in Forest-Courts or otherwise."

In this Edition are contained the Forms of Original Writs, Indictments, Corrections, Declarations, Pleas, Justifications, Warrants, Mittimus's Commissions, Deputations, Licenses and other Precedents and Proceedings (relating to the Game in General in short the present Laws of the Game are freely and clearly Treated of in this little Tract, and the whole system divided into Several Titles in an Alphabetical Order; a most approved Method for the reading and finding any Thing in a Book whereby the Reader may at once satisfy himself in his Inquiry without turning over the Voluminous Works in which the Laws of this Nature promiscuously lie dispersed."

You can see that in some ways the book bears a resemblance to our pamphlet *The Pennsylvania Game Laws*, except that the English Tract defines hunting game, hunting seasons, hunting country and enforcement officers; outlines the methods of appointing such officers

and how to proceed against offenders, giving specimens of warrants, indictments and law cases against offenders.

In the early days of the Britons, when the Princes and Great Lords had no occasion to set apart places for the preservation of game and wildlife, it was the interest of both Princes and Lords to destroy, rather than preserve them.

During the wars between the Britons and the Saxons, so many of the British were killed and so many fled from the conquering Saxons, that the cultivated lands were more than sufficient to maintain the conquerors and such British as remained among them.

When the Saxons found themselves masters of the British lands and people, the Saxon captains, in common council, agreed to divide the land that they had taken among themselves and their friends and companions in conquest. The woods, waters and thickets that were not apportioned to anyone, remained in the possession of the Chief Captain, who, in the presence of all of them, assumed the title of King and who, from time to time, granted parcels of such woods to whom he thought fit.

As a result of the success of the Saxons in Briton, their hungry and half starved friends and relatives swarmed out of Germany to Briton so that more and more useless woods were appropriated and improved. As these improvements were made, the game and beasts of prey were driven into the more infrequent woods where the Saxon Kings who liked hunting went for their diversion, and where there was so much game there was no occasion for laws to preserve it.

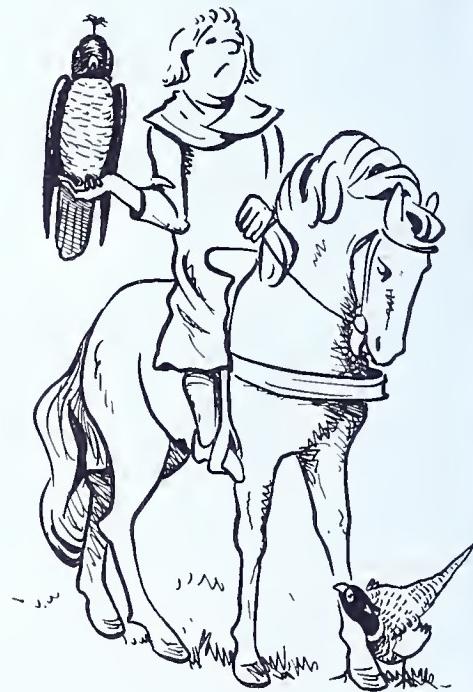
While the beasts of prey were so numerous in the Royal Woods as to prevent the increase of eatable game animals, the Kings permitted the Nobility and Gentry to hunt in their woods. However, due to the decrease in predators, King Edgar, who suc-

ceeded to the Throne in 959, prevented the hunting of deer and appointed officers to preserve all edible game in the woods. These officers were so efficient that the Nobility and Gentry were prevented from participating in the sport of hunting and their tenants from their respective rights.

At length, the arbitrary procedure of the officers so aggravated the Nobility, Gentry and Farmer, that they strongly complained that there were no laws to establish the King's prerogative and the people's rights in this case.

As a result, the Danish King Canute, who was crowned King of England in a Parliament held at Winchester in the year 1016, authorized the publication of Forest Laws, setting out the bounds of a Forest and limiting the power of the Forest Officers.

The Saxon Kings and the Danish King Canute made no new Forests



but were content with the woods that were their own domains and never granted to, or possessed, by their subjects. However, the Kings of the Norman Race which conquered Briton in the year 1066, not being satisfied with 58 different Forests, depopulated well built towns and villages to make additional places or their own private hunting.

William, The Conqueror, after the defeat of the Anglo Saxons in the Battle of Hastings, laid waste to 35 towns in Hampshire to make a Forest which he called the New Forest and his Forest Officers exercised such arbitrary rule as to even abridge the privileges the great Barons had enjoyed under the Danish and Saxon Kings and disregard entirely the liberties given by King Canute.

His son, William II, surnamed Rufus The Red (from the color of his hair), is recorded in history for the severity of his proceedings against all who hunted in his Forest, inflicting the punishment of death upon those who killed a stag or buck in hem without any other law than hat of his own will.

His brother, Henry I, who succeeded William Rufus in the year 1100 and his Grandson, Richard, Couer de Lion, who succeeded to the Throne in 1189, were as merciless as heir predecessors in punishing the Nobility and Gentry who hunted in the Royal Forest. Violators faced the loss of eyes, emasculation and other punishment, and no person was exempted from appearing at the Court of Justice upon a summons of the Chief.

In the reign of King John, who succeeded his brother Richard in the ear 1199, these and other oppressions exasperated the Barons, who took up arms, chose Robert Fitz-Water their General and marched to London. From there they sent letters o the Earls, Barons and Knights, who adhered to the King, stating hat if they would not join them in obtaining their liberties they would

proceed against them as public enemies.

These threats alienated from the King most of the loyal Barons, forcing him to grant the confederated Barons the laws and liberties they desired. These were drawn up as the Confederate Barons thought fit in two charters, namely: The *Great Charter* (the famous Magna Carta) and the *Charter of the Liberties and Customs of the Forests*.

Subsequently, King John raised an army of foreign soldiers and, under the sanction of a decree of the Pope, revoked his assent to the Charter. The Barons were taken by surprise and John, with his mercenaries, marched through the Kingdom perpetrating every species of cruelty and laying waste County after County with fire and sword. The Barons, having no other means of redress, then appealed to King Philip of France and offered to acknowledge his son-in-law, Louis, King of England on condition of receiving aid against their tyrannical sovereign.

An army was accordingly sent over from France with Louis at its head, and John assembled all his forces to oppose it. In going from Lynn to Lincoln his road lay along the sea-shore and, being overtaken by the tide, he lost all his carriages and baggage. This disaster, coupled with the distracted condition of his affairs, threw him into a fever of which he died in a few days in the year 1216.

Without delay the Earl of Penibroke, who was Marshall of the realm, caused Henry, the nine-year-old son of the late King, to be crowned Henry III. Penibroke was then chosen Protector of the Realm. One of his first acts was to cause the Great Charter to be renewed and confirmed. Consequently, most of the rebellious Nobles soon made their submission to this Government.

The army of Louis was defeated at Lincoln and a fleet bringing him aid was destroyed, obliging him to return to France.

It was not until the ninth year of the reign of Henry III, or 1225, however, that the Charter of Liberties and Customs of the Forests was confirmed under his seal and one sent to each County of England. The Charter was witnessed by 31 Bishops and Abbotts, 33 Lay Barons and Archbishop Boniface denounced a curse in Westminster Hall, in the presence of the King and several Bishops and Noblemen, against those who should break the Charter. Thus, many of the grievous oppressions, which the subjects of England had labored under, were remedied by this Charter.

Under the Charter there were a great many officers of the Forests and Chase, some of which were as follows:

**AGIFTOR**—An Officer that had charge of the domestic animals being brought to the King's Forests to feed.

**BEDEL**—A Court Officer of the Forests who made all proclamations concerning them.

**BOW-BEARER**—An Under-Officer



of the Forests who made an investigation of all damage to vert or deer. Under English Forest Laws vert included everything that grew or bore a green leaf within the Forest to make coverts. Special vert consisted of all trees growing in the King's own woods within the Forest and in other woods all trees that bore fruit on which deer fed.

**CHIEF JUSTICE IN EYRE**—An Officer of great honor and authority, a Peer, and always a member of the Privy Council. He was the highest Judicial Officer of the Forests and could appoint as many deputies as he pleased.

**FORESTER**—An Officer to preserve the vegetable and wildlife in the King's Forest and apprehend offenders.

**GAME KEEPER**—One who had care of, keeping and preserving of the game, being approved by Lords of the Manor.

**KEEPER OF THE FOREST**—An Officer who had charge of all things belonging to the Forest and the check of all the other Officers; also called the Chief Warden of the Forest—he had authority ranking next to the Chief Justice-in-Eyre and the authority to bail and discharge prisoners who were imprisoned or indicted for offenses in the Forests. When the Chief Justice-in-Eyre of the Forest decided to hold court he sent out his general summons to the Keeper of the Forest 40 days before to warn the Officers and others to appear.

**PARKER**—One who had custody of keeping a Park.

**PROTO FORESTER**—One whom the early English Kings made Chief of Windsor Forests to hear cases of the killing of the King's Deer in the Forest.

**RANGER**—One who was appointed to range the outskirts of the Forest and to drive the game animals safely into the Forest and to arrest any unlawful hunters.

**REGARDER**—An Officer whose

duty was to range the King's Forest guided by a Forester to see that everything was in order and that there were no offenses, or trespass, in the Forest concealed.

**STEWARD**—A Judicial Officer of the Forest who was familiar with the legal procedure of the Forest and joined with the Verderors and directed them in their proceedings.

**VERDEROR**—A Judicial Officer of the King's Forest whose duties it was to enforce the laws of the Forest.

**WALKER**—A Forest Officer appointed to walk about a certain space of ground committed to his care.

**WOODWARD**—An Officer of the Forest whose duty it was to look after the woods and vert. He must present all Officers within his charge at the Court of the Chief Foresters or Verderors. He was not allowed to carry a hunting weapon.

There were four (4) types of hunting grounds—*Forest*—*Chase*—*Park* and *Warren*.

A *Forest* was a certain territory of woods and pasture land where wildlife was protected by the King for his own pleasure in hunting with his friends and followers.

A *Chase* was sort of middle ground between a *Forest* and a *Park*. It was ordinarily smaller than a *Forest* and did not have so many law enforcement officers connected with it, but it was larger than a *Park*, having more Officers and game than a *Park*.

Every *Forest* was a *Chase*, but every *Chase* was not a *Forest*. It differed from a *Park* in that it was not enclosed, although it had certain boundaries. It was also licensed but was governed by the common law.

Certain Chases were made part of the King's Forest by the early Norman Kings and later were disafforested as having been taken in violation of individual or common rights when the Great Charter was renewed and confirmed in the year 1218.

Where a man controlled property in a Free Chase he could cut timber

without a license but he could not do so if his property was part of a Forest. In any event, if he cut so much timber that there was not enough cover left for game, he would be subject to fine or imprisonment.

The owner of land in a Chase could have permission to graze sheep and have conies, (or rabbits) feed there but he could not put on the land more sheep than it was usual to graze or make more coney burrows.

If a man had a Chase adjoining a Forest and denied the Keeper of the Forest the right to drive back the Stag he was fined, but Red Deer were allowed to be in the Chase by special permission.

Some times a person was allowed to have a Chase in a Forest, but was not allowed to kill or hunt any Stag or Red Deer.

. . . To Be Continued.

## Winter Kill Figures Revised

For lack of reports to the contrary it appeared, late in March, that Pennsylvania's deer herd suffered little loss through death from malnutrition last winter.

Later, when game protectors returned home from rabies assignments and trout fishermen took to the streams it was learned that in northern counties of the state the first appraisal was far from correct.

In the Game Commission's ten-county Northcentral Division alone game protectors in two counties reported severe losses in deer, and in two others the winter kill was considered above average. Potter County's loss was placed at 1350 and McKean's at 675. Clearfield's was 185 and Clinton's 102.

The total number of last winter's deer deaths submitted from this leading big game division was 2404. The loss of these deer was attributed to lack of food rather than protracted, severe winter weather.

# .22 Wildcats and Woodchucks

By Charles E. Travis, Jr.



Photo by the author  
scope sighted R. E. Donaldson made  
success of this meet-and-leap woodchuck.

WOODCHUCKS have been more or less successfully hunted with every calibre rifle from the muzzle loading cap lock rifle up to and including the most modern belted Magnums, but the most efficient of these rifles for use in farming country are the hot .22 center fires. These rifles, which include the .22 Hornet, .218 Bee, the .220 Swift and the latest addition to the list the .222 Remington make splendid woodchuck rifles and are also excellent for crow shooting when fitted with a

proper scope sight and shooting gun sling. These rifles are factory produced and can be bought over the counter nearly everywhere in normal times. They have excellent killing power, are most accurate and produce practically no ricochets, as the bullet is very light (45 to 55 grs.) and traveling at high velocity (2690 to 4110 feet per second).

Few hunters have the stalking and shooting ability to qualify them to hunt chucks with the .22 rimfire. Many people are mislead by the low

report of this innocent-looking weapon and consider it little more than a toy. Nothing could be farther from the truth. Because of its low velocity and lead bullet, it sends plenty of bullets whining cross country and can penetrate a human skull at a mile distant. Watch your back stop with all rifles at all times but be extra careful with the rimfires if you must use them.

As a fellow becomes more skillful in the shooting game he'll begin to look around for a cartridge to suit his needs that can't be "store bought." These cartridges are known as wildcats, because the rifles have to be made up special by private custom riflesmiths. Some of these wildcat designs are good and many are mediocre. The ones considered to be most accurate of these .22 wildcats are the .22-3000 R-2, sometimes called the Lovell, the .22 Varminter or .22-250, the Improved Zipper, the .22 Wilson Arrow, the .220 Rocket and the .219 Donaldson Wasp.

While I have used most of the foregoing calibres, my favorite for my type of hunting is the Wasp, which is made from the .219 Zipper case. Its accuracy is superb, and the killing power is ample to anchor even the largest and most rugged chucks at 300 yds. The use of a cartridge burning not more than 25 or 30 grains of powder in field shooting shows proper discernment. This tends to restrict the report to a tonal level permissible in most sections.

In the design and assembly of my .219 Donaldson Wasp rifle I used a Mauser '98 action with double set triggers and the bolt handle altered by forging to clear the scope tube. My riflesmith did a fine job of fitting and chambering the custom barrel blank. He also made a straight-line bullet seater, hand type, cut with the same reamers that formed the chamber. A case-forming die was furnished also. My stockmaker made the target type stock designed from

my sketches, and shaped out from a nicely figured blank of Oregon myrtlewood.

There are several fine telescope sights available suitable for this type of shooting. I have several makes of scopes on my various rifles and for this rifle I used a 12.5 power with 1½" objective and fitted with a floating dot reticule covering 1" at 100 yds.

This dot proved most excellent for wood chuck shooting, showing up clearly under all conditions of light and shadow, such as sometimes encountered when a chuck is looking things over from the cover of a fence row overgrown with weeds, honeysuckle or other ground growth. Without this dot you will find on many occasions that the chuck can be seen clearly, but the fine target crosshairs have faded out. An alternative is *coarse*, single crosshairs. Coarse hairs and a dot do not give sufficient emphasis to the dot.

After fire-forming a hundred cases, and test shooting a number of charges, I settled on the following as my hunting load: 30.2 grs. of DuPont 4320 powder, Winchester No. 115 primers (they now make only the No. 120, in the large size) and the Sisk 55 gr. soft point Express bullet. I used the 55 gr. Sierra semi-round nose bullet quite extensively for crows and for hawk shooting where super accuracy is very essential and it proved to be an excellent killer but these bullets have been difficult to obtain; possibly because of their great popularity and success in Bench Rest Shooting Matches and allocations of metals due to the "war which is not a war."

After sighting in my hunting load from my bench rest 100 and 200 yard ranges, a trip was planned next day into the haunts of the wood-chuck.

The area selected contained several freshly cut clover fields and a stand was taken along the edge of

a woods bordering such a field. I have found during the twenty-six years that I have hunted chucks that remaining unheard and unseen by the game sought is the better procedure. The field was searched roughly with the naked eye; this failed to spot any brown or grizzled "bumps" out in the hay meadow. Then the field was glassed more carefully with the B. & L. 7x50 binoculars. Now, wait a bit, there is the nose of a chuck sticking out of that den down under the stump grown over by poison ivy. As you watch, out pops the whole head and neck of a half grown chuck. The world has not as yet become his oyster, it is merely a wide expanse of grass and trees invaded now and then by a dog, a fox, or a man; and he is beginning to learn that the safest way to get along with all of these is to remain hidden, all but his nose. But, with the passing of the days, boldness and curiosity consume his mind. So, he has to come out just a bit farther to see exactly what it is that is over there, on the far side of his dinner table.

The hunter in turn, is patient and experienced. He doesn't shoot immediately, because he hopes to see two or three chucks coming out to feed, and perhaps he can shoot more than one. Sure enough, down in the corner comes a large old chuck, and is he a big one! His den is back in the blackberry bushes bordering the field down there, but he is coming out to feed on the clover. The binoculars are laid aside and the rifleman slips into the prone position, the sling was already in place on the arm, as it always is when I watch a field. The chuck peering from the den is selected for the first shot because he is the one most likely to disappear at the report of the rifle. From this point on, he might be selected from his class as the "chuck least likely to succeed in life."

As you look through the binoculars, you observe the target perfectly. Even the smallest motion, movement of his whiskers, the roll of an eye, a slight movement of his head are noted instantly. The dog is moved so as to place the spinning bullet as near the ear butt as is humanly possible. The set trigger is pressed, you carefully touch off the shot, and a most satisfying 'blop' comes back to the ears of the rifleman, signaling a proper hit. One soon gets to learn, also, the almost exact location of the hit by the instinctive movement of the target immediately as the bullet strikes. A 5 grain soft point from a .219 Wasp seems to get down to that wood chuck incredibly fast. The sudden jar of the rifle butt, and the disappearance of the chuck's head are like two rain drops hitting a window pane.

The shooter's left elbow is kept in its little hollow pressed into the ground, and a slight body shift is made in order that the other chuck may be brought into the field of the scope. He ran at the shot but stopped at the fence row edge being unable to see or locate the hidden rifleman. Another cartridge is slipped into the chamber and the trigger set. Just then the chuck, being curious as all his kind, sits up, but facing away and the dot is laid between his ears and the front trigger pressed. He drops in a heap and as I lay there watching through the scope I saw his tail come up and wave frantically, the sign known to all woodchuck hunters as the signal of a kill. Two more chucks were shot from this stand in the next half hour, then decided to go down and pick up. This should never be done until you are ready to leave for the day, as going to a shot chuck, however cautiously you may cross the field, may scare others in who are peering from the cover of fence rows far

bigback in a den mouth, or from the per-cover of high, standing grass in which they have not so far, been spotted. After you are located by the chucks, you will have a long wait before another shot within that area—if they are really scary they won't come out at all and will do their necessary feeding at night.

On examining the wounds of the chucks shot I was impressed by the damage done. The Wasp seemed to kill almost as well as my Varminter and sometimes on individual shots, quite as well. It used 4 to 6 grains less powder to do it! These four chucks were shot at ranges of 150 to 250 yards, and all head shots. I decided on head shots only, when possible, when killing for the sake of a big score began to attract me at all. I take all shots prone with gun sling or from a good solid rest such as a fence rail or a rock, stump, or other immovable object convenient to the hunter. The thrill in making a long uninterrupted run of hits is more satisfying to me, than a big tally of kills. Shooting at any chuck in sight whether it be 10 feet or 500 yards is not for the real rifleman. The degree of accuracy attainable today with the latest rather heavy woodchuck rifles and fine bullets of custom manufacture tends to make the rifleman think of the unimpressive future of chuck hunting. A hunter who shoots all winter in a gallery league is in splendid condition when chuck season rolls around and this type of shooter seldom misses from the prone position at sensible hunting ranges. Of course, if a man uses a 3-pound pull in the gallery matches and a set trigger outdoors, he must school himself to the change, and to never become absent-minded after he has once 'set' his set trigger mechanism. The rifle will then fire very suddenly.

Today a rifleman must use self restraint and discretion, in his own conduct while hunting. A modern

rifleman due to the extreme accuracy of his equipment, can shoot himself right out of woodchucks within one or two seasons. The days of really high scores on any kind of game in the United States, are gone, probably forever.

Getting back to the performance of the Wasp on woodchucks: My shooting partner who uses a .22 Wilson Arrow with target weight barrel, and carefully hand-loaded ammunition accompanied me on a trip to Bill Jones' farm. I had seen Bill in town a few days before and he mentioned that the chucks were making a nuisance of themselves in his alfalfa. Of course every chuck hunter likes to hear such things, so a trip to the growing alfalfa was in order. We left the car down by the barn and walked out to the hay meadows. While slowly topping a knoll in a pasture bordering the first field of alfalfa, we spotted a large chuck out in the middle of the stand, on his observation post on a big mound of dirt. Closer examination with the binoculars disclosed two additional chucks. One was sunning himself on a stump and another feeding along the edge of a woods on the far side of the field. Slipping back out of sight we bore off to the left to get into a more favorable shooting position, it being impossible to shoot from the other position because of the mass of green briars that hemmed in the field at this point. Prone, one could see nothing. We finally took our stand behind a poke-berry bush which acted as a screen and the sun being at our backs supplied a perfect set-up for seeing, yet not being seen. The chuck that we had spotted a little earlier sitting on the earth mound at the front door or entrance to his burrow had by now moved out into the field and was engaged in stuffing himself with alfalfa. Slipping the sling onto my upper arm and carefully poking the muzzle of the Wasp out through the briars, and the leaves



The author's brother with a half grown chuck. The rifle—a Savage 19 H re-chambered to a .22 K-Hornet.

of the poke-berry bush I got ready to fire. A cartridge was laid on the ground in the same position as the ammo block in target shooting. I decided on taking the chuck on the stump for the first bullet and my, but he showed up nice and sharp in the big scope. At the report, he rolled off the sun porch of his summer cottage and then lay on the ground below, with all four feet sticking stiffly up in the air. The big chuck in the middle of the field raced for his den. The dot was there waiting for him while he hesitated a moment on his doorstep for the usual last look. It was! He died right there. The third chuck had gone into his den while all this was taking place. After a wait of twenty minutes the glasses picked up a newcomer over in the far corner of the hay meadow; this chuck being of a red color somewhat like that of a red fox.

My shooting partner killed him with a bullet through the throat as the chuck sat erect facing us. Later

examination showed that the 55 grain Sisk bullet from his Arrow, had shredded the vertebrae and all flesh around it and had made a hole of exit about the size of a silver dollar. This shot was at 300 yards. If you get accuracy from Arrow ammunition, the flat trajectory of the cartridge gives a long killing range.

We took seven nice chucks from this stand that evening, and I was more than satisfied with the work the Wasp was performing. Its shooting is almost unbelievable to one unfamiliar with a fine shooting varmint rifle, especially those with a rigid barrel, good stock-bedding and weight closely approaching that of a bench rest rifle.

This ability of a *good shooting* rifle to hit a small target is shown in the following: From under cover of a large hole or depression made by the uprooting of a large oak tree, searched a 4" high stand of red clover for woodchucks. I map all my shooting ground fields before the chuck season opens and know where the various winter dens and the new summer dens are dug in relation to the location of the place chosen for the firing point. Because of the terrain or crops some fields require two or more firing points. This is particularly true if grazing cattle are turned out into, or have a habit of grazing or wandering over a portion of the shooting grounds. You must place yourself where you are at least partly screened, where you are sufficiently high so that you can see clearly over and beyond your whole field of fire, to absolutely prevent any sort of shooting accident.

But to go back to this woodchuck in the red clover: The binoculars disclosed that a chuck was there, but keeping himself well hidden. Only the top of his head, an ear and an eye, showed above the den rim. This, of course, was from a side view. The instantly fatal area was between the eye and the orifice of the ear. Bein-

a wary chuck, he held this exact position for over twenty minutes by my watch. Even then nothing else showed so I decided to take him "as was." The dot was held so that the rifle would place a bullet between the eye and the ear. The set trigger was set, and regular trigger most carefully pressed and the rifle fired. The usual report of the bullet striking a hard skull was heard, and then I saw him giving an occasional convulsive jerk of the body, in a forward direction such as follows a brain shot. This sort of hit makes one feel elated, as the range was 200 yards, and without a superbly accurate outfit such a hit is pure accident.

No matter what caliber you may select for chucks you will have to do your part of it. You must *not* expect to do the major part of your practice out in farmer Brown's cow pasture or in his hay meadows. No farmer wants to have some nitwit creating an uproar anywhere near his sheep, his cattle, or his house and poultry pens. Do your targeting and testing in some quarry or back lot where it

will annoy no one like your farmer hosts.

Within easy traveling distance of your home are only a certain number of really good hunting or varmint shooting areas. Some of them are definite game pockets. Others are gathering, feeding and roosting places for varmints. All are irreplaceable except at much greater travel expense from your home. Don't burn down your own hunting grounds by miserable conduct or by senseless over-firing of practice shots. Do not permit other hunters you may meet, to get all of you run off. It's your shooting grounds, by the grace of a few farmers. Make every possible effort to keep in *their* good graces.

Impress upon all that *your* rifle is safe. You never shoot recklessly with it. It groups most of its shots within an inch at 100 yards, so there is nothing to fear from its bullets anywhere else. Be as courteous and careful on the farmer's property, as if on your own. Then you and the farmer will get along!

. . . . *The End.*

## DEFENSE AGAINST RABBIT ATTACK

Cottontail rabbits perennially annoy residents of Pennsylvania towns and cities with their flower and bulb eating in early spring and their vegetable garden raiding later.

Game protectors and trappers employed by the Game Commission remove tens of thousands of these unwanted bunnies from municipalities every winter, thus reducing the potential rabbit damage. But some always remain to plague gardeners. However, with choice foods available it is almost impossible to bring rabbits to trap in late spring and summer.

Many gardeners become incensed at the bunny depredations, but relent when they realize that if a mother rabbit were taken from her tiny young they would perish.

The best way to beat the problem appears to be more defense spending. In the case of small gardens, where the outlay is within reason, 18-inch mesh wire, 6 inches of it buried in the ground to prevent burrowing under, solves the protection problem. Openings in the mesh must be no larger than one inch if little rabbits are to be kept out.

Sprays and dusts, such as dried blood, rotenone and tobacco dust, sold by merchants handling seeds and garden equipment, are usually effective repellents. Directions on the package should be followed implicitly. A line of moth crystals, poured around the garden border, often proves an effective bar to the invasions of Brer Rabbit.



# *Wild Turkey Research Report*

By Roger M. Latham

Chief, Wildlife Research Division

THE estimated wild turkey kill for the 1951 season was 8,962 birds. The hunters responded to the request for turkey feet by sending 163 pairs to Harrisburg. This is obviously an inadequate number for accurate sampling, but several interesting facts were determined from the examination of the feet.

Of the 163 birds represented, 44 were gobblers more than a year old and 54 were young toms of the year. There were 27 older hens and 38 young hens. The ratio of toms to hens was 1.5 : 1, indicating that Pennsylvania hunters tend to select the larger gobblers for their trophy.

Only 18 of the 163 turkeys were killed in the southern half of the state. The south-central portion which only a few years ago represented the entire turkey range in Pennsylvania, now produces a comparatively few birds. The bulk of the turkeys are killed on the newly extended range in the northern half of the state, which is now providing some of the finest turkey hunting in the country. These birds are even spilling over into New York in the same way the deer did a few years ago.

Research investigations are currently under way to determine the cause of the decline in the southern counties, and management measures are being undertaken to restore this grand game bird to its original numbers in this area. By repeated heavy stocking with high quality game farm birds and by trapping and transferring wild birds from the northern counties, it is hoped that this restoration will be completed.

. . . *The End.*

# Pike County

## Pocono Vacationland

**Twenty-third In a Series**

*Note: If desired, this center sheet can be removed without damaging the magazine by loosening the two center staples.*

### Land Area

The county contains 357,120 acres, of which 317,154 acres are forested. Publicly owned land comprises 270,094 acres, 12,599 acres of which are State Game Lands. State forests comprise nearly 60,000 acres.

### Topography

The surface of the land is uneven, but not mountainous except for the Pocono range which enters the southwestern part of the county. Its numerous lakes are the result of glacial action.

The Delaware River forms the eastern border of the county and Lake Wallenpaupack a portion of its western boundary. Other principal streams are the Lackawaxen River, Shohola, Masthope and Blooming Grove Creeks, the Saw Kill and the Raymond Kill.

### Transportation

Railroad transportation is furnished by the Erie and the Delaware Valley railroads. The Roosevelt Highway (U. S. 6) and other routes traverse the county, which has 232 miles of improved State highways.

### District Game Protector

Albert J. Kriefski, Blooming Grove, has jurisdiction over Lackawaxen, Palmyra, Blooming Grove, Greens and Porter counties.

John Lohmann, Box 157, Milford, has jurisdiction over Shohola, Westfall, Milford, Dingman, Delaware and Lehman counties.

**Fish Warden**  
Ralph O. Singer, Tafton.

### Agriculture

Although 89 per cent of the county's area is in forest lands, farming forms the chief occupation. Crop values are about \$208,000 annually, while livestock products are valued at approximately \$419,000.

### Industry

The principal classes of manufacturing industry are textiles and textile products and lumber and its remanufacture. The quarrying of flagstones is an important local industry.

### Historic

The fertile bottom lands near Milford are thought to be the first territory in Pennsylvania to be occupied by white men. Here Dutch settlers built their homes in 1682.

The first Englishman to visit this territory was Captain Arent Schuyler, who, in 1694, was sent into this territory by Governor Fletcher of New York to determine whether or not the Indians had been persuaded to join with the French at the time of the French and Indian Wars.

Prior to the infamous "Walking Purchase" the relationship between the white settlers and the Delaware Indians who occupied this territory was quite peaceful. However, in re-



... KEY ...



- County Seat.
  -  State Forest Fire Observation Tower.
  -  Game Protector's Headquarters.
  -  Bear Hunting.
  -  Deer Hunting.
  -  Turkey Hunting.
  -  Small Game Hunting.
    - { Grouse,  
Pheasant,  
Rabbit &  
Squirrel.
  - ← → Railroad.
  - ~~~~ Stream.
  -  State Forest Land.
  -  State Game Land.
  -  Primary State Game Refuge.
  -  State Park or Picnic Ground.
  -  Pennsylvania Route Number.
  -  U.S. Highway Route Number.
  - 5101 Legislative Route Number
  - ===== Township Route (T-430)



PENNSYLVANIA  
GAME COMMISSION

# PIKE COUNTY

PENNSYLVANIA

Scale in miles

taliation for the wrongs the Indians believed had been done them during negotiations for the purchase the settlers were later raided until it became necessary to call upon the Proprietors for help. Benjamin Franklin was sent to Easton where he organized the defense of the settlers. Pike County's company of 39 men was raised under Captain Van Etten and forty dollars was offered for each scalp taken from an Indian warrior.

This territory was also the object of a long-term dispute between the provinces of Connecticut and Pennsylvania which gave rise to the Pennamite wars. It was not until after thirty years of intermittent warfare that Pennsylvania gained undisputed control of the county.

Thomas Quick was the first settler in the town of Milford. His son, Thomas, Jr., was the fabulous "Indian Killer" who killed 99 Indians and died a natural death at a ripe old age, regretting that he had been unable to make it an even 100.

From early days Pike County was a key point in traffic between New York, New Jersey, and Pennsylvania, and Port Jervis was a principal port of entry into Pennsylvania for traders, goods, and travelers from New Jersey.

The Delaware River furnished power and transportation, and aided immensely in the development of the county's early lumbering industry.

#### **Recreation—Hunting**

Pike County is primarily a big game state, ranking high in the production of deer and bear. Grouse hunting is also excellent, and trapping good.

Game Lands Number 183, near Blooming Grove, comprises 2,778 acres; Number 116, near Lackawaxen, comprises 4,024 acres; Number 180, near Lords Valley, comprises

1,406 acres; Number 209, near Milford, comprises 4,391 acres.

#### **Recreation—Fishing**

Fishable waters (name of stream or lake, fish stocked, location and length or area of stock waters) include: Balliards Creek, brook trout, Greeley, 2 mi.; Big Bushkill Creek, brown & rainbow trout, Bushkill, 6 mi.; Little Bushkill Creek, brook trout, Milford, 11 mi.; Dingmans Creek, brook trout, Dingmans Ferry, 6 mi.; Indian Ladder Creek, brook trout, Dingmans Ferry, 4 mi.; Kellam Creek, brook trout, Hawley, 2 mi.; Lackawaxen River, brown & rainbow trout, Lackawaxen, 12 mi.; Middle Branch Creek, brook trout, Porters Lake, 3 mi.; Millrift Creek, brook trout, Millrift, 3 mi.; Panther Brook, brook trout, Shohola, 3 mi.; Raymondskill Creek, brook & brown trout, Milford, 9 mi.; Savantine Creek, brook trout, Milford, 4 mi.; Saw Creek, brook trout, Bushkill, 5 mi.; Sawkill Creek, brook trout, Milford, 2 mi.; Shohola Creek, brook, brown & rainbow trout, Shohola, 15 mi.; Twin Lakes Creek, brook trout, Shohola, 4 mi.; Wallenpaupack Creek, brown & rainbow trout, Green-town, 6 mi.; Big Tink Pond, black bass, Bohemia, 80 A.; Delaware River, black bass, Milford, 63 mi.; Fairview Lake, black bass, Tafton, 110 A.; Pecks Pond, black bass, Pecks Pond, 300 A.; Twin Lakes, black bass, Twin Lakes, 235 A.; Wallenpaupack Lake, black bass, Paupack, 5,000 A.; White Deer Lake, black bass, Blooming Grove, 48 A.

#### **State Recreational Areas**

The county contains many recreational areas, chief of which are Promised Land, Peck's Pond and Owego State Picnic Areas.

. . . *The End.*



# The High Cost of Plinking

By Keith C. Schuyler

Photo by the author

*Kids like these and their adult counterparts do more than one million dollars damage to private and public property with guns annually.*

AT THE critical moment, just as the surgeon was about to perform the most delicate part of the brain operation . . . the lights went out. By the time the emergency system had been switched on in the hospital, the damage had been done.

The next day, an ambulance speeding from an accident with an emergency case was forced to wait at a crossing where a long freight train was stopped in obedience to a sudden signal for which there seemed to be no reason. By the time the trouble was located, and the train moved on, the ambulance driver had no need for haste.

A rural home owner grabbed the telephone to report that his house was on fire, heard the operator, then the phone went dead before he could give his number. He wasted more time with the dead phone, then

turned to help his wife remove the children from the second floor where they were taking an afternoon nap. The stairs were blocked by flame.

A motorist, hurrying to a wedding in a part of the state with which he was unfamiliar, could not interpret the rusty "dead-end" warning of the bullet-spattered highway sign, failed to make the right angle turn and plunged over the high embankment of the river.

Fortunately, these are all merely hypothetical examples. But every one of these tragedies could happen as the result of carelessness and vandalism with firearms.

Too frequently we associate the danger from firearms only with the direct damage they can do to the human body. However, each year countless dollars are lost to carelessness and maliciousness in addition to

untold heartaches and trouble through violation of the rules and responsibilities that go with a gun. And we dare never lose sight of the need to further perfect the record of firearms safety. Too many in this country await the slightest opportunity to bring further restrictions upon our birthright to bear arms as Americans.

In the mishaps with guns wherein property is damaged, it is usually the after results that are more serious rather than the direct damage caused by the projectile itself. And, contrary to general belief, damage caused by adults is often comparable to that caused by youngsters.

Of the various utility companies, railroads and the highway department contacted in regard to damage resulting from firearms, inquiries produced one notable fact. *Much as the actual cash loss is deplored, loss of service to customers and the real danger to human life and property loom as the two most disturbing factors.*

It is impossible to determine the national or state bill for damages caused by firearms, for few departments keep an actual record of costs attributable to this cause alone. However, it is safe to estimate that the annual loss in Pennsylvania exceeds one million dollars.

For instance, one major telephone company has spent over \$112,000 during the past five years locating and repairing such damage. This represents a total of 1,812 separate cases or an average of 360 per year—nearly one a day.

The Pennsylvania Department of Highways estimates its cash loss at \$120,000 annually from damaged markers. However, this figure includes all types of vandalism.

A major electric utility provides some interesting figures on its cost of replacement and repair of firearms damage. "A good average cost for damage done to street lighting equip-

ment would be \$10 per unit. Regarding insulators and conductors, costs may vary from \$5 to \$50, dependent upon several factors such as the voltage of the line, whether the line must be de-energized to make repairs and whether repairs can be scheduled or must be made immediately under emergency conditions. If they can be scheduled, the importance of the line determines whether the line can be removed from service during regular work days or whether work must be done at premium rates during a light load period such as a Sunday."

There have been cases where conductors were damaged on a single power line supplying a large town which completely interrupted service to the town and to all its industries.

Railroads have long been a target, literally speaking, of youths with a gun and the need for something at which to shoot. There seems to be something irresistible about signal lights, telephone line insulators and even, on occasion, flasher signals at crossings.

One of the most vulnerable and expensive units of equipment is the case and its enclosed instruments which operate signal lights. These cases and their contents cost anywhere between \$500 and \$5,000, depending on the size of the installation. Not infrequently these cases have been shot into with extensive damage resulting. Even more serious than the direct damage have been the delay to trains and interruption to schedules.

Cases are on the records of one of our largest railroads where the bullet lodged between two wires in a signal cable in such a manner that false battery was placed on a wire and the wrong indication resulted on the signal. In such cases hundreds of lives may be placed in jeopardy.

Sometimes wires are only damaged, and a break does not occur until extremes in temperature cause the remaining thread of wire to separate.

Consequently, it is impossible to determine when the actual trouble will result. It may come in the dead of night in remote areas.

Colored glasses shot out of a signal light, a common result of uninhibited target practice, can easily be the cause of a terrifying moment for the engineer of a speeding train. The white signal which results when the colored glass is gone, "must be regarded in its most restrictive indication," and calls for an immediate report to the section superintendent.

Since some railroads have their own telephone systems, they suffer along with the utilities which provide this service to your homes.

Aside from the shooting of insulators, also common trouble for electric utilities, the greatest trouble and hazard to telephone service results when bullets are shot into main cables. These cables carry numerous wires, and often a single bullet will sever a number of these wires.

Locating the source of trouble is frequently a real headache for linemen. For, even a .22 caliber bullet can do extensive damage, and the tiny hole it leaves in the cable requires minute checking.

Damage to highway signs is most evident to the general public. The little spot of daylight showing through a patch of rust on a marker is not an infrequent sight . . . especially along secondary rural highways.

Secretary of Highways E. L. Schmidt has this to say about damage to Pennsylvania Department of Highway property. "As our accounting system does not separate the cost of sign repair, we can only give an estimate of the damage. But, in the considered judgment of our traffic and maintenance engineers, the bill will approach \$120,000 per annum. This estimate is based on an average cost of about \$6.00 for the repair of hunter - sportsman - marksmen-vandal damaged signs."



Photo by the author

*Only a 12 gauge pumpkin ball managed to penetrate this sign, but .38 pistol bullets and a blast from a shot shell helped to complete the job.*

"In an average year, about 20,000 signs are mutilated, hence the total cost is estimated at \$120,000. We believe this is very close to the actual figure."

The state of Wyoming has had so much trouble with free-lance rifle experts that the highway department in that state has issued paper targets to be used in lieu of road signs. Working on the assumption that the highway markers have a special appeal to marksmen, the department had the targets made to exactly resemble the regulation signs . . . with the addition of three convenient bullseyes.

Issued free to all comers, the targets are given with the suggestion that they be used as substitutes for the metal markers when sighting in rifles.

There are two seasons of the year when the long suffering utilities and highway departments can expect the most trouble. One is the post-Christmas period, when recipients of rifles

from Santa Claus go out and shoot up the countryside, and the other is during and right before the big-game hunting seasons.

Youngsters old enough to handle a firearm, but too young to be fully appreciative of the trouble they can cause, provide the most trouble in the spring months. The more persistent carry on their target practice throughout the year, but they are normally at their best, or worst, at the time when a young man's fancy normally turns to thoughts of other things.

Fortunately, the kids usually confine their destruction to property of a relatively inexpensive nature . . . such as insulators and street lights. But in the fall of the year, their grownup counterparts move up with the big guns.

Not confining themselves to such trivialities as insulators, the "big boys" blast away at transformers, instrument cases and heavy cables. A deer rifle aimed in the wrong directions can mean "lights out" or dead telephones for large sections of the population.

And then, of course, there are the off-season depredations such as occurred in one section of the state when a New Year's Eve celebrator deliberately shot out a telephone toll cable.

If what has been written to this point might seem overplayed, a moment of sober consideration will dispel this notion.

The victims of carelessness with firearms mentioned here are each businesses which serve the general public. Their representatives usually make every attempt to avoid publicity even when they are lucky enough to catch the person responsible for the damage.

In the interests of good public relations and a genuine regard for the culprits, who seldom realize the seriousness of their offense, the com-

panies "go easy" on them. The companies are usually satisfied to recover any damages. If it becomes a matter for the police, however, the consequences are severe in some cases.

It remains for us to police ourselves and our children to eliminate this wholly unnecessary and malicious use of firearms.

Most sportsmen are familiar with the political attempts that have been made to restrict the ownership and use of lethal weapons. We have all seen the examples in Europe of too much interference with a man's right to keep and bear arms. Even in this nation some states have managed to pass laws which hamstring this inherent right of Americans.

We dare not, must not, give the lawmakers any excuse to pass restrictive regulations on the use of guns beyond those laws which are coincident to common sense and proper behavior.

No father should give his son a weapon of any kind, or permit him to acquire one, without teaching him the proper use of it. But, first the father himself must develop faultless habits with firearms before he attempts to educate the boy who is going to emulate him.

Aside from the moral obligation to refrain from damaging property which is not our own, we have a strictly personal stake in protecting property owned by utilities, railroads and highway departments. In the case of corporations, added costs as the result of gun damage means higher rates to users of their services . . . you and me. Damage to highway department property, property which is actually *owned* by us, is reflected in higher taxes.

It is a good investment in national security, sound economics and plain common sense to always keep the muzzle of our gun pointed at proper targets.

With guns, it *always* pays to . . . be sure, be sensible and be safe! . . . *The End.*

# Outdoor Reveries

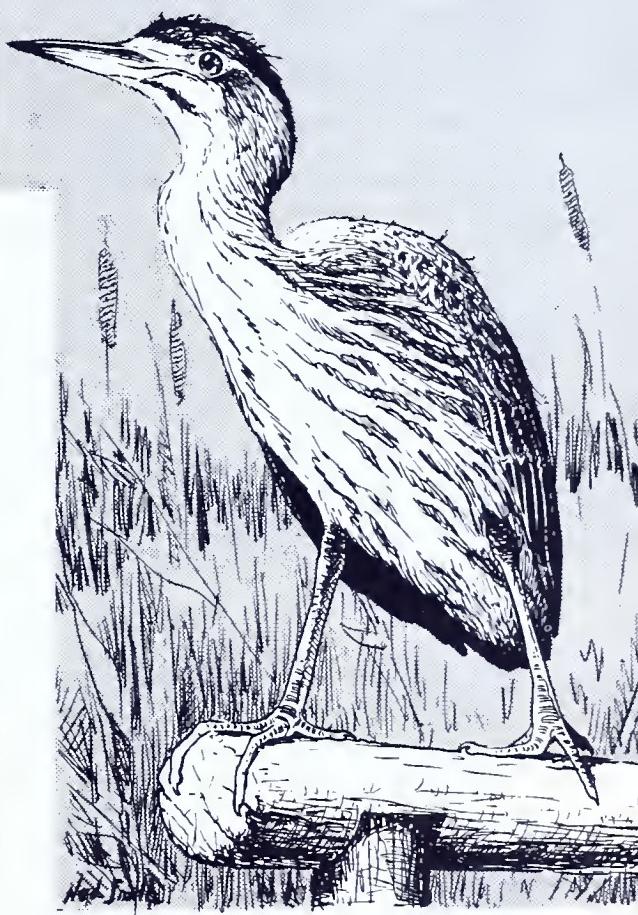
## *Watery High Road*

By John H. Day

THE best way to explore the countryside on foot is to wade right through it. Especially is this true in mid-July when every thicket conspires with its greenbrier and its blackberry canes to say to the perspiring countryman: "You shall not pass!" Seek out the largest, widest, shallowest stream, plunge boldly in, and follow this watery highroad through the heart of your chosen hinterland. The countryman who wades as he hikes walks right through Ma Natures' back door.

For full enjoyment of this stream strolling avoid the hot, heavy hip boots favored by chance anglers encountered along the way. A pair of comfortable old shoes, heavy socks to add cushion, and an old pair of slacks make up the ideal wading ensemble. After the first step or two the soothing water squishes comfortably between grateful toes and the countryman is ready for anything, be it tumbling riffle or waist-deep eddy.

There are no breath-taking vistas along the waterways—no ridge road panoramas. But there is a wealth of interesting wayside treasure trove



practically underfoot. This back door approach produces entertaining encounters with unsuspecting wildlings. The stream hiker moves close to sloping banks crowded with the shiver ferns and shrubs which shun the dusty roadsides.

I splashed along through a long flat stretch where the limpid water eased across wide ledge rock. Here and there a flat stone had found lodging in flood time, and had built up a tiny silt foundation. Turning these stones is a fascinating pursuit. Nearly all provide shelter for a crawdad or two. Occasionally a fat hellgrammite will float free as his lair is revealed, and will jerk awkwardly down stream in the cloud of silt.

The more exciting interludes come when the shifted stone reveals

a big watersnake coiled in the shadows, ready to wriggle away from there with reckless abandon which sometimes takes him across the countryman's bare arm. There are water pennies, and caddis cases, and all sorts of odd marine life to be found under these stones.

I dispatched one small water snake who made the mistake of running under a tiny flat rock which I could stomp, and picked up a handful of hellgrammies. On the cliffs above the creek the purple flowering raspberry displayed its gorgeous blooms in a setting of wild hydrangea. There was thimbleweed in the brakes and a plant or two of tall meadow rue towering above a bed of maidenhair fern.

Just around the bend I came upon the biggest sycamore I have even seen. This giant leaned across a quiet pool as though enjoying its shimmering image. At ten feet above the ground the huge bole is six feet through. This barrel-chested plane tree rears 90 feet into the air, throwing out huge limbs which are as large as ordinary non-ambitious sycamores.

In a shale-bottomed stretch the shiners schooled in nervous shoals, winking at me in fitful spurts as they turned in the sun. Here the crayfish were everywhere, scuttling in all directions as I advanced. A young green heron sat on a bridge railing and eyed me anxiously before seeking a less revealing haven high in a water elm.

Damsel flies fluttered along the weedy edgings and a big dragon fly of the ten-spotted clan obligingly picked up a mosquito which had been buzzing around my head. The "snake feeder" was so intent on his quarry that he nearly collided with my shoulder. A kingfisher kept flying up ahead of me. I was in no hurry, and he had plenty of time to smash the eddies in search of minnows. Finally he nabbed one and

rattled over my head on the way to his dining perch.

Butterflies danced in airy nonchalance along the waterway—"seeing only what is fair, sipping only what is sweet." The gorgeous blooms of the swamp milkweed served as colorful foil for a magnificent tiger swallowtail, and a cluster of tiny fellows with white wing bars found interest in the damp moss close above the water.

I found a convenient log seat near one of the pools and spent a pleasant half hour in the heart of that steamy fastness. The brook had fallen so low as to have lost its voice. The quiet in that remote dell was broken only by the hum of busy insects and the occasional rasping cry of a locust filing the silence to an edge.

The first item of interest to come along was a hapless member of the Mayfly clan who had fallen into the stream. He came floating in at the head of the pool, kicking and struggling, but could not get off.

## CORRECTION

On page 14 of the May issue of GAME News the following MIS-information appears: "A 7x35 has a 50 mm. objective . . ." This should have read, "A 7x35 has a 35 mm. objective; a 7x50 mm. has a 50 mm. objective, which being much larger, therefore lets in a great deal more light." Sorry.

the water. Here surely was a tasty morsel for one of the shiners loafing in the shady depths.

The sluggish current floated the insect slowly around the perimeter of the pool, then directly across the deepest portion. Each time the fly would struggle I could see the flashing of shiner sides beneath it, but strangely there came no strikes. Suddenly one of the little fish struck hard and the fly disappeared, only to

appear again on the surface, apparently unharmed, a few seconds later.

For some reason these minnows did not want that Mayfly, and it finally came to water-logged mooring beside a floating leaf. Even the whirligig beetles ignored it. They raced their motors and skidded around on the water in wide circles, but they seemed more intent on practicing for their regatta than in dining on one juicy Mayfly.

While I watched the Mayfly episode a thread-waisted wasp came to the side of the pool for a load of mud. Somewhere nearby this busy mud-dauber was building a set of adobe apartments and here was her source of supply. She made several trips while I sat there, biting out a mouthful of the moist mud with each trip, and hustling off to plaster each load into place.

The most interesting visitor of the afternoon came by while the sun was really bearing down on that weed-tangled valley. One of the day-flying clear-winged moths stopped in for a drink of water and entertained me for some time. Buzzing around just like a hummingbird, he would swing a wide circle above the pool, then suddenly drop for a swift sip after the manner of a swallow drinking from a wide pond.

At least a half-dozen times the moth made that peculiar dive. Each time the whole shiner population of the pool exploded in a smashing strike, but the clearwing was always up and away. In deeper ponds harboring bigger and more hungry fish, drinking in this manner could be dangerous business.

I came suddenly onto a marshy spot and scared aloft an immature green heron who wasn't quite sure whether to run or stay. This youngster got up into some low willows and entertained me for a long time with some most comical posturing. He walked solemnly up and down

those slanting willow trunks, his stub of a tail betraying his agitation, all the time keeping me in sure focus.

Close in against a hillside housing some big timber I came to another opening where the green "jungle" funnels down to a sandy oasis silted into being by a tiny brook at flood stage. A multitude of wild honeybees kept this spot busy all day long. They were gathering up something needed for the home colony there in the moist sand—perhaps water to dilute the honey.

The sun was in the right quarter to create a luminous glow in that green funnel which touched each hurrying bee with a shimmering halo. Down they came on speeding wings, to settle in the sand and crawl about busily, picking up whatever it was they were collecting. Then up they went through the funnel, quite plainly loaded down, steering a course which led between a tall water elm and a tulip poplar and then on up to the timbered hillside.

The countryman is always fascinated by the marvelous methodical doings of the wild bees. I stopped in that sunlit glen for a long half hour, watching the golden throng come racing down the funnel, while the laden workers hoisted themselves up the same path, always steering directly for the bee tree somewhere up there in the trees.

At the invitation of the chamber of commerce of lower cattail valley I recently made a tour of inspection of our local mosquito factory. It was a hot July afternoon and under the urgent prodding of a blistering sun the assembly lines were going full blast. I arrived on the site of the main factory after following a devious trail which led first over the fence behind the house, and then through a tall sea of mustard and teazel to the edge of a sizeable bit of standing water.

In this natural setting, against a

handsome background screen of broadleaved cattail, the mosquitoes have established their production lines. The females come singing in at dawn, after a night of fearsome bloodletting in the neighborhood, to lay their raft-like egg masses on the surface of the water. If Old Sol cooperates there will be several hundred brand new "wrigglers" abroad by 4 p. m.

The sun was over my shoulder and at just the right angle to light up the interior of the factory. Hundreds of wriggling larvae were hard at work hunting out bits of food between trips upstairs for air. Schedules call for seven days on the wriggler lines when the July sun is hot. Then the would-be mosquitoes roll along for two days in the pupal case finishing rooms.

On the surface I could see many of the tiny abandoned pupal cases which had split open to release the adult insects. Here they had rested, riding these cast-off garments until their wings had unfolded. Then most of them had taken off in the direction of our bedroom windows, where they display a fiendish skill in forcing the screens.

. . . *The End*

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### **Brush Control Reconciles Economy and Wildlife Values**

Properly used, chemical brush killing compounds can make public utility rights-of-way valuable to wildlife and simultaneously greatly reduce maintenance costs, the Wildlife Management Institute reports. This has been demonstrated and tested in Massachusetts. Under the supervision of Dr. Frank E. Egler, noted plant ecologist and research associate of the American Museum of Natural History, a 48-acre forest of sprout growth around a transmitter of Station WHDH has been converted to

permanent low brush. Maintenance costs have been reduced to a minimum.

Conservationists have become alarmed over blanket spraying to eliminate brush from transmission lines. Power sprayers, under the usual system, are used along the lines during the spring, drenching all foliage with oil solutions of weed killer. Overgrown power lines are attractive to wildlife, and the usual spraying season corresponds with the height of the breeding season; many nesting birds and young mammals are killed, directly when toxic substances are used, or by exposure when brush is defoliated. Blanket spraying also risks law suits from the drift of chemicals to neighboring private croplands and woodlots. In addition, annual heavy spraying is needed because undesirable species tend to sprout rapidly in spite of repeated spraying.

All of these objections can be eliminated, Dr. Egler has shown, by selectively killing tall-growing plants and encouraging low-growing shrubs, herbs, and grasses. Under this system, the heavy sprouters are poisoned during the winter by spraying the lower stems of the plants. Practically no sprouting results and the remaining vegetation prevents invasion of undesirable species. The site treated under Dr. Egler's supervision was formerly a red maple swamp, and the dominant species is notoriously difficult to control. Five years after the initial spraying, this tree has been eliminated from the area. Blanket spraying costs about \$15.00 a year per acre for the first six or seven years and drops to around \$9.00 for annual maintenance. Costs for the initial spraying under the Egler system range from \$6.00 to \$23.00 an acre, depending upon the density of the brush, and drop sharply to \$2.50 an acre for annual maintenance.



Photos by the author  
With a good face lifting and the construction of a dam the Old Lehigh Canal will soon furnish recreation for nearby communities. The area between the canal and the river will be utilized as a game propagation area.

## *Canal Days Will Soon Be Here*

By Harvey R. Frantz

FISHING and swimming again in the old Lehigh Canal will soon be a reality, due to the efforts of the local Sportsmen's Clubs of the Lehigh Valley. It was in this Canal that many of the present-day sportsmen learned to swim and where they caught their first fish.

The Lehigh Canal running from Easton on the Delaware River to Mauch Chunk, a distance of 46 miles, commenced operation in 1830. It was

one of the connecting links between the hard coal fields of Pennsylvania and the metropolitan and export markets of Philadelphia and New York. But with the development of railroads and later highways, canal traffic gradually pattered out. In 1931 the last commercial canal boat passed through Bethlehem.

Floods of 1942 took out some of the dams and portions of the canal and definitely put the canal out of the transport business. The Lehigh Coal and Navigation Company, owners of the canal, still, however, maintain portions of the canal as a source of water supply for various industries. Through no fault of the Company, the canal, where it traverses communities, became a depository for junk, garbage and cesspool drainage.

The portion of the canal between Lock 43 in Bethlehem and Lock 44 in Freemansburg, a distance of about two miles, was no different from other portions of the canal unless it had more rubbish and pollution. Occasionally a hardy sucker might be caught but the filth and debris discouraged any swimming or recreation.

There had always been talk of doing something about the canal but the talking stage was so far as it ever went. The Company did what they could to keep the canal clean and orderly but public indifference and apathy countered all their moves.

In the fall of 1951 Leo Gallagher, President of Freemansburg Rod and Gun Club, most of whose members grew up along the canal, called a meeting of the local Sportsmen Clubs to see what steps could be taken to clean up that portion of the canal that literally flowed through their own backyard.

Six clubs sent representatives to the meeting. They were the Freemansburg Rod and Gun Club, Bethlehem Fish, Game and Forestry Association, Hellertown Sportsmen's

Association; Miller Heights Sportsmen's Association; Lower Saucon Sportsmen's Association and the Monocacy Field and Stream Association. Preliminary to the meeting Gallagher had contacted officials of the Canal Company and so was able to inform the representatives of a suggested form of action.

The Company had said they would gladly talk over the possibility of leasing or renting a portion of the canal to an organized group. The representatives, on hearing this, decided to organize and incorporate as an Inter-Club Canal Commission, the Commission to be made up of delegates from each of the six clubs.

A committee of this group met the canal officials and requested permission to lease the portion of the canal between Lock 43 and Lock 44. A lease was drawn up stating a dam would be constructed by the Inter-Club Canal Commission to impound water for fishing, swimming and boating. In turn the Canal company agreed to furnish sufficient water to fill the dam and maintain an agreed level. The Commission would also be responsible for maintaining and policing this rented portion of the Canal.

Now that the Inter-Club Canal Commission was organized and a portion of the Canal leased the work was just beginning. First the Canal itself had to be cleaned out of its years' accumulation of junk. This meant putting on waders and getting out in the muck and throwing or dragging the rubbish to shore where it was loaded on trucks. The sportsmen, ably assisted by Junior sportsmen, met one day each weekend and worked the entire day, broken only by a lunch donated by various merchants and interested parties. While the bottom was being cleaned, other groups were cutting the brush and trees that had grown up on the banks and sides of the Canal. Occasionally a disturbed nest

f yellow jackets would enliven the work.

The Commission had signs printed and posted stating the purpose of the organization and prohibiting dumping in the Canal. Colored slide talks, newspaper releases and a general educational program was undertaken to enlist the local people's help and cooperation in keeping the Canal clean.

The three scours or breaks on the low path side of the canal will be filled this spring by local contractors who have fill to dispose of. As the dam is to be a rock-crib type it was necessary to obtain ties and poles for its construction. The call for this material had hardly made the rounds of the various clubs when 150 railroad ties along with a supply of used power line poles were promised. These materials have since been picked up by the sportsmen and delivered to the dam site.

The merchants of the surrounding communities as well as the communities themselves have assisted the project by material contributions and service. As an example the Boro of Freemansburg loaned the Commission their truck to haul away the refuse taken from the canal while a local tree surgeon offered his power saw to cut up the poles and ties for the dam construction.

The dam is expected to be completed this summer and the stocking

of fish should take place next fall. By that time the few remaining sources of pollution in the canal will be taken care of by the newly constructed Bethlehem sewerage plant.

By next year the two miles of rehabilitated canal will be open to the public for safe swimming, good fishing and possibly boating. Planting the canal bank with seedlings and shrubs will complete the project.

The area between the canal and the Lehigh River will be used as a game propagation area. This area is overgrown with trees and shrubs and forms ideal food and cover for small game. The rabbits in this section are protected from wandering housecats and stray dogs by the canal and hunting is prohibited by both the Commission and the Borough. This excess game, which will be live-trapped and released in other portions of the county, might be considered a by-product of the canal project.

It is hoped that the work accomplished by the inter-club Canal Commission, Inc. will be an inducement for other organizations along the Lehigh Canal, as well as other semi-abandoned canals in the state, to do likewise. There are miles and miles of similar potential recreational sites in Pennsylvania just waiting for the sportsmen's Clubs to move in and take over.

. . . *The End*

### SCHOOL OF FISHING AND HUNTING

A new wrinkle in the instruction of novice and experienced anglers and gunners is Captain Tom's School of Fishing and Hunting, operated in connection with Baltimore City College, Baltimore, Md. Classes started February 4 and will continue for thirteen weeks on Monday evenings.

Instruction is given in the following subjects: Fishing—salt water—basic, salt water—advanced, fresh water—basic, fresh water—advanced, fly tying. Casting—fly casting (wet and dry), plug casting, tournament casting, boat casting, spinner, surf casting. Hunting—firearms and ammunition, special classes in archery. Diplomas are awarded for accomplishments in each course and prizes are awarded for highest marks attained.

Interest in such an institution should spread to other sections for it makes for interesting and profitable off-season activity.

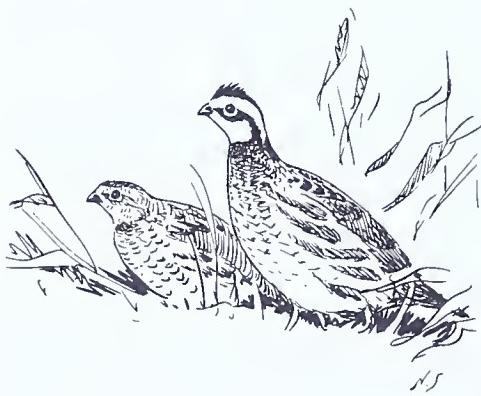


### Time to Move

HONESDALE, Wayne Co.—On May 8, while breaching a series of beaver dams that had flooded a road and some fields I noticed a muskrat swimming up through the still water of the beaver dam carrying something in its mouth. Although it passed by where I was working, it paid no attention to me whatsoever and disappeared into the marsh only to reappear again in a matter of two or three minutes. Swimming as swiftly as possible, it came to the dam I was working on, down over it, and disappeared into the murky water below. It appeared again in a matter of seconds, climbed over the breast work of the beaver dam and again swam into the marsh. She made this trip 5 times just as quickly as she could and did not pay any attention to me. She had an important job to do. She was carrying a baby muskrat in her mouth each trip. District Game Protector Robert H. Myers, Honesdale.

### Bobwhite Making A Comeback

WAYNESBURG, Greene Co.—The quail increase in Greene County this past year looks very encouraging for



these birds. At one particular feeder this spring, I counted 36 birds feeding at one time, the previous year only 6 fed at this feeder. The number of birds observed this spring compared with last year I believe to be about four times as many. Acting Game Protector Andrew Ewart, Carmichaels.

### Too Many Ducklings

LINESVILLE, Crawford Co.—The artificial wood duck nesting boxes placed at Pymatuning were well accepted again this year. A check of 51 boxes this month showed that wood ducks were using 35 boxes. Tree swallows were nesting in one and a family of young screech owls were in another. The number of eggs in the boxes used by wood ducks were from 10 to 26.

Upon approaching one of the boxes I was attracted by a peeping noise inside. I carefully raised the lid of the box. I discovered three newly hatched wood ducklings. There were also four eggs, one of which was in the process of hatching. Another egg was "pipped" and ready to hatch. One of the ducklings had been hatched for some time for it was completely dry and fluffy. It was very active and would scamper right up the side of the box and try to escape. What amazed me was the speed with which it was able to maneuver around the box by climbing up and down and across, like a downy wood-pecker climbing about a tree.

I looked around for the mother duck but could see no sign of her. The eggs were cold and two of the ducklings seemed weak from exposure. I knew from a previous trip that this box had held 21 eggs and

it was my guess that the eggs had hatched unevenly and the mother duck had gone off the nest with the other 14 ducklings and left the seven eggs to their own fate. I brought the eggs and ducklings in to Headquarters and a bantam hen adopted them. I guess this particular wood duck female was very similar to the Old Lady in the Shoe except she had so many "ducklings" she did not know what to do. District Game Protector Raymond M. Sickles, Linesville.

#### Fox Not So Foxy

LANCASTER, Lancaster Co.—Mr. Andrew Eberle, a member of the Lancaster County Sportsman's As-

around the ouside for about five minutes when an adult gray fox appeared and attempted to enter the den. A terrific but short fight occurred, lasting about thirty seconds, with the groundhog standing his ground. When the gray fox went around to enter another hole, Mr. Eberle shot it and found it to be a male in very good physical condition. District Game Protector John M. Haverstick, Lancaster.

#### Under the Spreading Chestnut Tree

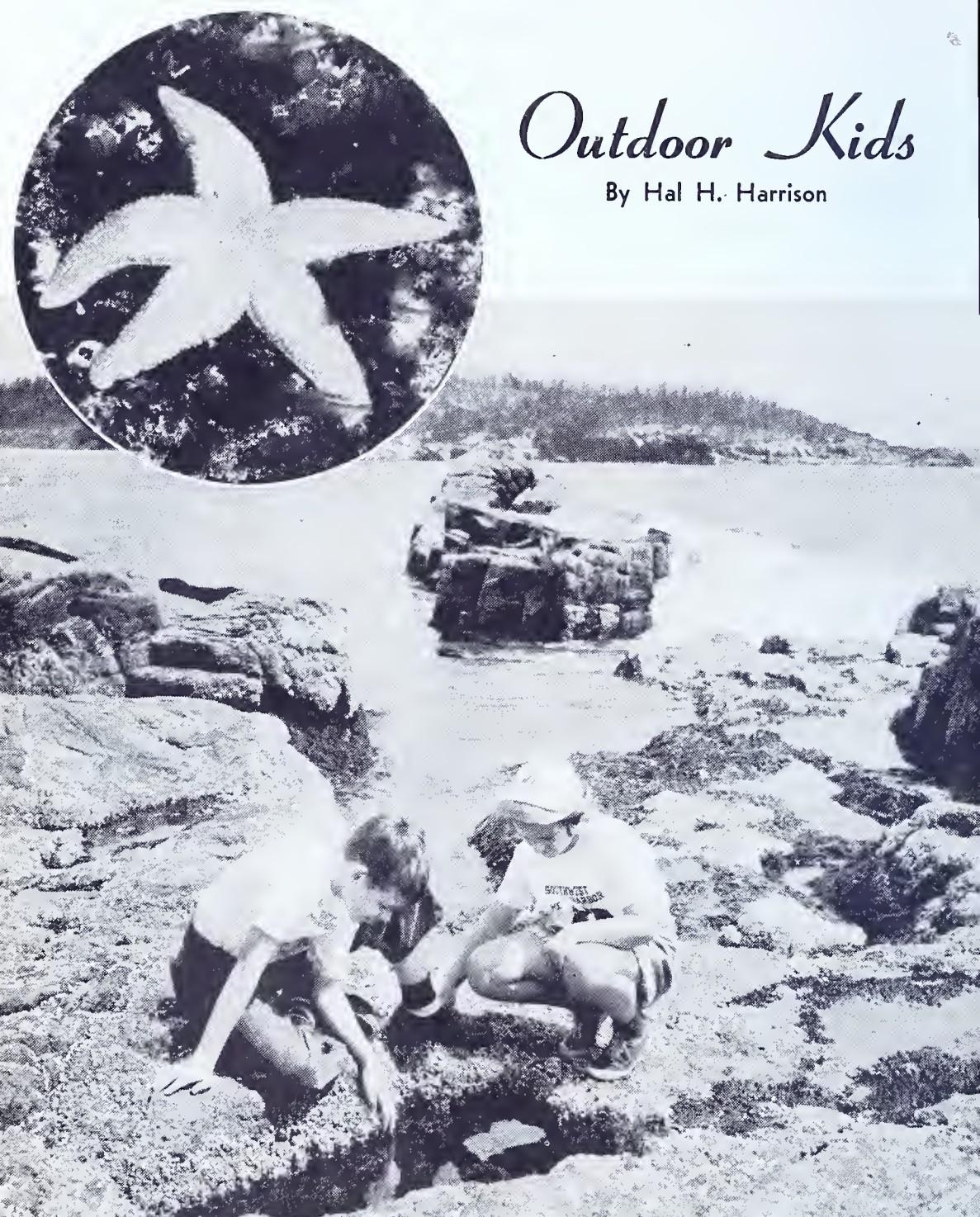
PATTON, Cambria Co.—One evening during the past month, a Mr. Hoover, of Patton, called and related the following story. He stated that he had taken on the job of cleaning up an old building that had been used as a blacksmith shop about 30 years ago. On the second floor of this building laid an old bellows, used in blacksmith work, and as he climbed the stairs he noticed a weasel running into the mouth of the bellows. Upon investigation, Mr. Hoover found a nest of young weasels inside the mouth of the bellows (two young weasels and an adult female, which he killed). Two dead rabbits about two weeks old lay next to the nest. District Game Protector Granville A. Miller, Barnesboro.

#### The Hot Seat

KUTZTOWN, Berks Co.—One evening last week Mrs. Edgar Ziegler, East Main Street, Kutztown, phoned me that a wild duck and eight young were sitting in the middle of the street in front of her house, which is on Route 222, and that they were tying up traffic. I went to the scene and drove them into a grain field. I had found it to be a black duck and her day-old young. Apparently in crossing the concrete they had found it to be warm and thought it to be an excellent place to spend the night. District Game Protector Harry H. Rickert, Kutztown.



sociation reported an interesting experience that occurred one evening. While perched in a tree watching a fox den, near his home in Manheim Twp. he observed a groundhog come up to the den. The groundhog lingered around the outside of the den until Mr. Eberle threw a shotgun shell at it and scared it into the hole, where it remained for about forty-five minutes. When the groundhog did come out again he laid



# *Outdoor Kids*

By Hal H. Harrison

IT IS a real treat for Billy and Jane to visit the seashore. They live in Pennsylvania where they seldom have the opportunity to enjoy the many outdoor adventures that come to children who live by the ocean.

However, when Billy and Jane go with their parents in the summer to places like Maine, Massachusetts and New Jersey, they miss no chances to see what they can find on sandy beaches or along rocky shores.

In Maine, Billy and Jane find many unusual things in tidal pools. These are little pools of water left in the rocks when the tide goes out. When the tide is high, the pools become part of the ocean again.

In these pools are many living things that have been washed in by the water. Some will go out again when the tide is high. Others live in the pools all the time, waiting for each new tide to bring them fresh food and a change of water.

One of the curious things that Billy and Jane find in the tidal pools is the sea urchin, a close relative of the starfish. It looks like a burr because it is covered all over with sharp spines. It looks like a pincushion too. Some sea urchins are green and some are purple. Aided by teeth and tentacles, the sea urchin scrapes its food off rocks.

Barnacles by the thousands are attached to the rocks. As youngsters, these tiny animals swim in the sea. When they become adults, they attach themselves to rocks (and sometimes to the bottom of ships) with a cement-like fluid from their own bodies. Here they are anchored for the rest of their lives, and here they must wait for high tides to bring them food. Between tides, barnacles keep their shells tightly closed in order not to dry out.

Mussels, like barnacles, attach themselves to rocks. They can be distinguished by their dark shells.

Once Billy and Jane found a sea anemone. It looks like a flower growing on a rock. The mouth is the top of the stem, around which there are many feelers, like petals. It has no eyes but depends upon the feelers to tell it when food is near. When any small thing touches the feelers, they close around it and push it into the mouth.

There are many other things in tidal pools, too, such as whelks, periwinkles, sponges, sea lettuce, starfish, rock shells, and sometimes a crab.

If you go to the seashore this summer, be sure to look for these things, like Billy and Jane do.

. . . *The End*

### COOPERATION WITH A CAPITAL "C"

The following letter by C. J. Haywood, Deputy Game Protector, Monongahela, describes a brand of sportsmanship and cooperation seen all too infrequently in hunting circles:

"I decided to plant a few food plots on one of our co-operator's farms to insure sufficient food for winter feeding. The cooperation that I received was really remarkable. It shows that there are many sportsmen who are interested in our game out of season as well as in season.

"To begin with, I am indebted to the Beck Brothers, Pete and George, for the use of their land for these food plots. They assured me that the land can be used for this purpose as long as we want it.

"Mr. George Church, District Game Protector, supplied the seed and fertilizer with an assist from Mr. Bowman. May I state that George was very cooperative in planning these food plots.

"The Donora Sportsmen's Club offered to pay all truck expenses to the State Game Lands at Burgettstown to secure three tons of lime for this project, but through the efforts of Mr. Hornickel and Mr. Miller of the Donora Zinc Works, this lime was furnished free of charge and was trucked to the location by Mr. Edward Short, of the Joseph Short & Sons Construction Company.

"All material being available, the job of plowing, discing, liming and planting were the next items on the agenda. These were done by John Robinson, who worked after his regular work day and even furnished the fuel and oil for his tractor.

"To my mind this is an example of true sportsmanship, and I wish to convey my thanks to all concerned for their splendid cooperation. May they profit by having more game and a better place to hunt."

That's the way it's done, fellows; it's everybody's job.



## Duck Outlook For 1952

Waterfowl breeding progress mostly favorable . . . A good early hatch indicated . . . Threat of drought still over southern prairies.

Such is the basic summary of current waterfowl conditions on the nesting grounds of western Canada, reported in the June issue of the *Duckological* by Bert W. Cartwright, chief naturalist of Ducks Unlimited.

Analysis of immediate conditions by the veteran naturalist provides powerful evidence that waterfowl are putting forth a magnificent effort to reproduce. . . . In Alberta, a farmer estimated 50 waterfowl nests within a 400-acre field and an official Ducks Unlimited transect produced an instance of 125 breeding pairs within one square mile.

The same situation exists in Saskatchewan, where duck populations are believed up over last year in central and northern areas. All indications point to a generally successful hatch in the Wheat Province.

Latest reports by Ducks Unlimited fieldmen in Manitoba tell of truly remarkable waterfowl nesting activity, particularly on smaller projects in the southwest . . . One 47 acre DU project showed 126 breeding pairs, a 10-acre project had 95 pairs and the upper half of the 90-acre New York-Ballantyne project displayed no fewer than 175 pairs of family-conscious ducks.

Of these smaller DU projects Cartwright stated, "A striking example of the value of smaller projects under drought conditions . . . They are much more productive per mile of shoreline than the larger marshes and are coming through beautifully this year."

At one point stating that the threat of drought is not yet critical the *Duckological* in conclusion nicely illustrates present achievements of waterfowl with this actual field observation . . . A proud Pintail leading a near-record brood of 14 tiny ducklings and apparently as unconcerned with future drought prospect as a sailor adrift in a lifeboat.

*Ducks Unlimited (Canada)*

## West Virginia Sportsmen Organizing

West Virginia hunters and fishermen are teaming up for the purpose of safeguarding the soils, waters, forests and wildlife of the Mountain State.

An organization known as *West Virginia Sportsmen Unlimited* has been born, and already boasts more than two thousand members. At an initial statewide meeting held recently at Camp Ceasar near Webster Springs, the following officers were elected: President, Robert B. Hill, St Albans; vice-president, W. R. Clinger, Parkersburg; secretary, Leo Young Durbin; treasurer, K. P. Webster Rand.

Secretary Young will edit an organization newspaper scheduled to make its appearance soon.

Primary objectives of the new association, according to President Hill include stream pollution abatement, better protection for the timberlands which cover more than two-thirds of the state, and improved habitat for both game and fish. West Virginia has not had an active conservation league or federation since before World War II.

A system of county and regional

epresentation has been worked out and the next statewide meeting will be held in September.

## **Junior Conservation Camp For 1952**

The Federation of Sportsmen's Clubs will again sponsor a Junior Conservation Camp for 1952. As in past years it will be held at the Forestry Camp Building, several miles southwest of State College. Wilbur I. Cramer, Assistant to the Executive Director, will again be responsible for the Pennsylvania Game Commission's part of the program, which will consume nearly two days for each of the four groups to attend the camp. These four groups will each comprise approximately 30 to 35 high school freshmen and sophomores.

The commission's contribution to the program will be as follows:

### **FIRST DAY**

- 8:00- 9:15 a.m.—The Sportsmen's Automobile—The State Game Commission
- 9:30-10:30 a.m.—Firearms Safety & Woods Courtesy
- 10:45-12:00 noon—Rifle Instruction
- 1:30- 5:00 p.m.—Group No. 1—Rifle Instruction—Firing on Range—Qualifying for NRA Medals and Prizes  
Group No. 2—Predator Trapping and Practical Demonstration
- 7:30- 9:00 p.m.—Address  
Open Forum Discussion of Field Problems of Game Commission or Habits of Wildlife
- 9:00-10:00 p.m.—Wildlife Movies—"Adventures of the Outdoor Kids"

### **SECOND DAY**

- 8:00-12:00 noon—Group No. 1—Predator Trapping and Practical Demonstration  
Group No. 2—Rifle Instruction—Firing on Range—Qualifying for NRA Medals and Prizes
- 6:30- 8:30 p.m.—Field Safety and Wildlife Identification Problems (Field Trip on Immediate School Area)

## **Japanese Sportsmen Seek Aid**

The Pennsylvania Game Commission is frequently called upon to aid sportsmen in other parts of the world. Recently a letter was received from Japan requesting information on the revision of hunting regulations in that country. Gene Zenier, Warner Pathé News, writes the following from Tokyo:

"From faraway Tokyo I am taking the liberty of asking you a big favor. As the only foreign member of the All-Japan Hunting Club, I have been asked to help the Japanese Government in making various changes in the present game laws.

"As a former resident of the state of Pennsylvania I can think of no other state that offers better game laws. I am therefore kindly going to ask you many questions regarding the functioning of your Game Commission so that I may present your setup to the Hunting Section of the Japanese Government."

Mr. Zenier's letter then proceeded with a list of inquiries regarding seasons and bag limits, violations and law enforcement, financial setup, game reserves, etc., then added a description of present conditions in Japan that call for remedial measures.

"Japan at present has practically no game laws, with hunters shooting out of season, many with no license, shooting both cocks and hens, and many other violations too numerous to mention," he adds. "I am certain that the Hunting Section of the Japanese Government will greatly appreciate any information which your Commission may send me for use as a pattern for future Japanese Game Laws."

Needless to say the Commission dispatched to Tokyo an adequate supply of literature on all phases of Commission activities and organization, with sincere wishes for better hunting conditions in Japan.

## Bounty Removed From Alaskan Eagle

A regulation issued by Secretary of the Interior Oscar Chapman extends federal protection to the bald eagle in Alaska, according to the Wildlife Management Institute. This nullifies the 30-year-old bounty law of the Alaskan legislature under which premiums have been paid on more than 100,000 birds since 1917.

Under the new regulation eagles may be killed any time they are found killing game and livestock, but the promiscuous shooting of the national bird for bounty will cease since the order provides that no portion of the bird be possessed or transported at any time. Although the bounty law remains on the Territorial law books, no one can collect it without violating the new regulation. To collect the bounty it is neces-

sary to present the feet of each bird to designated authorities.

The color of the male bird has much to do with whether or not he helps with brooding the eggs. If he is inconspicuously colored like the female, he takes his regular turn. If he is brilliantly colored, he stays away from the nest.

\* \* \*

The tree frogs hibernate when cold weather begins and sleep continuously until the return of higher temperature. And if warmth never returned, the sleep would continue until the little creatures died from exhaustion of vital organs.

\* \* \*

Fresh water clams spend the first part of their lives as parasites on fishes.



PGC Photo by Parliament

An annual event for the Southwestern Division of the Pennsylvania Federation of Sportsmen's Clubs is their meeting at the cottage of Commissioner Ross L. Leffler at New Florence, Westmoreland County. Delegates from the Game and Fish Commissions were also present, and a tour of Game Lands #2 was on the itinerary.



## *Filming Wildlife at Night*

JOSEPH J. McHENRY of St. Marys, Pennsylvania, is a dyed-in-the-wool hunter who knows how to hoot deer—in more ways than one!

Tired of the ordinary run of picture-taking, Joe decided one day to combine his favorite sport of hunting with his lens work. A lot of deer roam the woods near his home, and he figured that if there was some way in which he could rig up his miniature camera with flash-bulb and trigger trip, he might be able to coax the game up close enough at night to take its own picture.

Norbert Wolf, a friend of Joe's, offered to help and the two enterprising men took a discarded Model A Ford reflector and built around it an unique automatic flash camera outfit which permitted wild game, such as bear, deer and even porcupine, to take their own portraits after dark—while Joe was asleep.

His first outfit was crude, all right. The homemade setup consisted of a metal box in which a small 35mm camera nested. A lens peephole was cut in the front, and the Ford reflector which contained the flashbulb was mounted on top. A C-battery was housed inside the box to set off the flash.

With camera loaded with fast film and a flashbulb inserted, a fine string or lengthy piece of No. 20 thread was stretched across a runway or salt lick where deer were known to roam. One end was fastened to a tree or other firm support, while the other tied in with the flash outfit itself. Of course the lens was prematurely set for approximate distance, and the aperture reduced as much as possible to permit a sharp picture. The camera box was mounted firmly so that it could not be upset or otherwise damaged. (Continued on Page 55)



All Photos by Joe M  
Outdoor Photographers

Using inexpensive equipment Joe M has made some outstanding night traits of deer, or rather, has let them take their own portraits. Three buck one shot (above) is quite a feat, a three-legged doe on the opposite equally rare.



Comes night. No cold, sleepless hours waiting in blinds. The photographers are comfortably back at home. Down the woodland trail ambles a deer towards the salt lick. He brushes against the taut thread and the pressure is enough to activate a solenoid, which, in turn, clicks the shutter as it sets off the lamp.

The practical-minded photographers haven't worked out a way of having the animal re-set the shutter and insert a new flashbulb. As a result, it is possible to obtain only one flash picture each night—unless, of course, the photographers remain close at hand to prepare the outfit for a new exposure.





Joe McHenry now has quite a collection of striking wildlife pix—some showing deer standing, jumping, staring and running away. One of his choicest bits of luck was a closeup of a three-legged deer, illustrated in this article. Other striking wildlife portraits are shown here for further study by camera-clicking enthusiasts.

Joe has improved his original outfit considerably by substituting fine wire instead of thread, and utilizing two reflectors with flash instead of one. But the principle is still the same—let the deer do all the work!

Fast film is used, preferably Eastman Super-XX or one of equal speed, and the average exposure with a General Electric photoflash lamp No. 11 is f/5.6 to f/8 at 1/100 second, which

*Upper photo shows how Joe set up camera and flash arrangement for the d shots. When set the camera is covered the metal box. Camera and Ford reflector on the left is an experimental model.*

varies of course with the distance subject from camera and the background color.

Is wildlife filming within the realm of even rank amateurs?

Joe McHenry thinks it is. Until a couple years ago, the wildest subjects Joe ever filmed were family shots and the baby. With a little inspiration and perspiration of your own, claims you can probably adapt the outfit pictured here to fit your own camera and your particular needs.

After having assembled a fine collection of deer pictures, Joe is going after still harder game—wild turkeys. They're a pretty smart bird, thinks Joe. Well, Joe's a pretty smart photographer, too!

. . . *The End.*

# Your Rifle's Sure Hitting Range

By Ed Shearer

SUMMERTIME means varmint time to an ever increasing lot of inters. With the chances of getting shot at a buck being few and far between, more hunters are coming to realize that if they are to make good when that chance comes along, some shooting during closed season is indeed. The answer is—varmints.

Now I believe that a hunter should shoot the rifle he is going to use on game as much as possible but there are limits as to what any one rifle will do, however good it may be. There are many methods of hunting varmints and many types of country they are hunted in. These two things really determine whether your hunting rifle would be suitable for YOU use on varmints.

For instance if you belong to that school of thought that believes stalkin' them is the only true way to Heaven and you hunt in broken country that affords good cover, then best any modern hunting rifle with suitable sights will get you by, for average range will run about 100 yards.

If the country you stalk them in is fairly open, then your rifle will have to be as much better as the average range is increased.

Another group loves to prowl the country with binoculars, scopes, etc. and shoot 'em from where they is. These brethren are the true exponents of precision and mathematical calculation. They count the day lost when they haven't whanged an un-

suspecting chuck through the vitals, way out yonder.

Now the things that determine the suitability of a rifle for any of these various methods of varmint hunting are sights, trajectory and cone of dispersion, commonly called group. In this month's issue we will show the average hunter and newcomer how, by considering these three factors, he can determine for himself the suitability of his rifle for his own hunting conditions.

First we will consider briefly the trajectory and its physical characteristics. The path of the bullet through the air from the muzzle to the target is in the form of a parabola, not a straight line as many think. The farther the target from the rifle muzzle the more curved the parabola will become. Also the faster the bullet travels the flatter or less curved this parabola will be over a given distance, because it is acted upon for a shorter time by the forces of gravity.

As a bullet always travels in a curved flight the barrel must be pointed above the target to allow the bullet to ascend sufficiently to overcome the forces of gravity that act upon it during its flight to the target. The height or angle the barrel is pointed above the target depends on the distance and is called *elevation*. The path of the bullet is called *trajectory*.

The rear sight is adjusted to stand a little higher above the axis of the bore than the front sight, thus when we bring them into alignment with the target, the axis of the bore is pointed upward sufficiently to allow for the drop of the bullet. By making the rear sight adjustable we can obtain the proper angle for any desired range.



We will now reduce the angles to understandable working terms. Riflemen and ballisticians refer to the angle the barrel is pointed above the target as minutes of angle. A minute of angle is 1/60th of a degree and subtends 1.047 inch at 100 yards. Thus if we start two lines from a point one minute of angle apart and extend them to 100 yards they will be 1.047 inches apart. To simplify matters riflemen call it one inch. So one minute of angle is one inch per 100 yards. This would be two inches at 200 yards and so on.

In discussing sight adjustments we will pass over the open rear sights as their adjustments are not fine enough for serious vermin shooting. This brings us to the modern micrometer rear sight. They have graduations and scales the same as a micrometer, hence the name.

Let's assume that the front and rear sights are 36 inches apart. In 100 yards there are 3600 inches. This divided by 36 gives us 100. So a movement of 1/100 of an inch on the rear sight will move the striking point at 100 yards one inch or one minute of angle.

Take the Lyman 48 micrometer rear sight as an example. The graduations on the side scale are in multiples of 5 minutes each. The screw head at the top has 5 numbered minute graduations and for further refinement each of these minute graduations is divided into quarters. If we turn the screw head one numbered graduation we move the sight adjustment one minute on the target. If we move it a full turn we move the adjustment 5 minutes and the indicator on the side scale will show a movement of one graduation or 5 minutes.

The Redfield micrometer sight operates on the same principle, the main difference being that the graduations on the side are in multiples of three minutes, each fifth graduation being longer than the others

and numbered 15-30-45-60. Values of shorter sight distances can easily be found by dividing the distance between the sights into 3600.

Telescope sights operate on the same principle and the mounts are usually 7.2 inches apart. The graduations on the mounts are in half or quarter minutes of angle for both elevation and windage. Sometimes they are finer.

Hunting scopes are fitted with internal adjustments of minute, half minute, and quarter minute divisions depending on their use and power. Windage is adjusted the same way.

It is the custom to describe the trajectory curve by giving the height of the curve at one half the distance between muzzle and target. The curve is measured above an imaginary line from bore to target called the base line for trajectory. The facts are the maximum height of trajectory is always a few yards beyond mid range, but this variation can be disregarded at ranges under 500 yards.

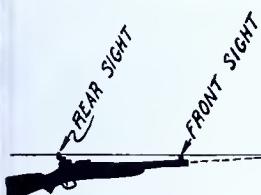
With a rifle that gives a 6 inch trajectory at 100 yards it would be easy to hit a deer at 200 yards or any point in between but a squirrel would be a different matter. Thus the flatter the trajectory the greater the distance we can surely hit small objects, granting the necessary accuracy, of course.

This brings us to the third vital factor in sure hitting range which is dispersion or cone of fire. Due to jump, vibration, etc., barrels throw their bullets in a more or less cone shaped spread. The distance between the extreme outer bullet holes determines the size of the group. The standard of accuracy of any rifle is the size of the group it will shoot at a given range. It is obvious that a rifle must group within the size of our target if we expect to hit it with any degree of certainty.

Now we will use these three factors to enable the hunter to determine

or himself just how far he and his rifle are capable of surely hitting an animal of a particular size. We will use the .22 cal. rifle as an example, as most hunters are familiar with it and my rifle can be evaluated the same way.

Probably the smallest game hunted with the .22 cal. is the gray squirrel.

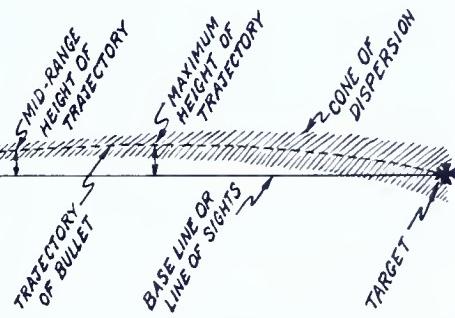


The average gray squirrel has an average head and chest cavity diameter of about 2 inches that we must hit for a clean kill. Therefore our trajectory should be such that the bullet should not strike more than one inch over or under the point of aim when aiming at the center of the vital area. Now suppose the front sight is .75 inch above the axis of the bore and we are using the high speed cartridge with a muzzle velocity of 1375 f. p. s. and which has a trajectory above the base line of 2.9 inches at 50 yards when sighted to strike the point of aim at 100 yards.

Now draw this base line on a sheet of graph paper. Then draw the line of aim from a point .75 inch above the center of the bore to intersect the trajectory at 75 yards. The trajectory curve will then be one inch above the line of aim at 40 yards. So measuring vertically from the line of aim to the trajectory curve, we see that by sighting the rifle to strike the point of aim at 75 yards the bullet will cut the line of aim at 12½ yards, hit one inch above it at 40 yards and cut the line of aim again at 75 yards and be about one inch low at 85 yards and 3 inches low at

100 yards. Theoretically, with no error we would kill our squirrel up to 85 yards every time.

But now old man accuracy steps into the picture. The best .22 cal. sporting rifles have at least a 3 inch spread or group at 100 yards. So we draw two curved lines from the muz-



zle point paralleling the trajectory curve which will have a spread of 3 inches at 100 yards. The area between these lines is the cone of dispersion, and determines the distance at which we can surely hit a given sized target.

Thus at 27 yards this cone goes above that inch line of aim and is the maximum range at which we can be sure of hitting a squirrel in a vital spot with the rifle sighted for 75 yards. But on a crow which has a 3 inch vital area, by running along the cone of dispersion we see that the crow is contained in the dispersion lines up to about 80 yards, which is the sure hitting range on crows.

By sighting the same rifle to strike point of aim at 50 yards we could extend the sure hitting range on squirrel to about 38 yards but would miss the crow at 80 yards, by shooting under.

Keeping the above in mind, the quick way to determine the suitability of your rifle for any sized game is to do this:

Set up a target that has a bulls-eye big enough for good vision at YOUR average hunting range. In deference to the high price of am-

munition fire 5 shots at the said target with the gun sighted to strike point of aim at that distance, using a sand bag or other support.

Now measure the distance between the most widely separated shots. If the size of your group is less than the size of the vital area of the game sought, well and good. Now move up half way and fire 5 more shots. If the extreme spread is still within the vital area of the game the rifle is O. K.

As a rough guide you can expect the following sized groups from different class rifles in good condition.

Lever action tubular magazine rifles such as the .30/30, .32 special, etc. 3½ to 5 inches at 100 yards.

Savage model 99 solid frame ir .250 cal., 2 to 3 inches at 100 yards

Modern bolt action rifles in such cartridges as .30-06, .270 and .257 cal will run from 1½ to 2½ inches at 100 yards. Some individual rifles will do better than this, as will some custom rifles.

This is a rough but convenient way to find out what size target and at what range you and your rifle are capable of making a sure hit.

. . . The End

### 1951 BEAR KILL

With the completion of the tabulation of the bear kill reports an unusual number of exceptionally large bears was noted. Eleven weighing 400 pounds or more each have been reported, as listed below. Weights shown are those entered on game kill reports and have not been verified by the Commission.

Name & Address	County	Twpnsp.	Date	Sex	Weight
Robert A. Beers R. D. No. 2 Nazareth, Penna.	Pike	Dingman	11-19	Male	545 Lbs
John J. Kucinski 849 East 23rd St. Erie, Penna.	Warren	Pleasant	11-19	Male	501 Lbs
Samuel Norris Ridge Ave. Curwensville, Penna.	Clearfield	Bloom	11-22	Male	465 Lbs
Samuel J. Romesberg R. D. No. 2 Rockwood, Penna.	Clearfield	(not shown)	11-19	Male	450 Lbs
Wayne Taylor R. D. No. 1 Albion, Penna.	McKean	Norwich	11-19	Male	450 Lbs
Homer Hough R. D. No. 1 Scottdale, Penna.	Potter	Portage	11-23	Female	450 Lbs
Patrick J. Sheehan R. F. D. Ashville, Penna.	Clearfield	(not shown)	11-19	Male	420 Lbs
Ward Gardner, Jr. R. D. No. 2 Weedville, Penna.	Elk	Jay	11-19	Male	415 Lbs.
Milton Deeter R. D. No. 1 Somerset, Penna.	Cameron	Shippen	11-19	Male	408 Lbs.
L. C. Pierce Lickingville, Penna.	Forest	(not shown)	11-19	Male	407 Lbs.
Ernest Booth Star Rt. East Stroudsburg, Penna.	Monroe	Middle Smithfield	11-22	Male	400 Lbs.



By Thomas A. Forbes

## PART I

**A**RROW Points is written primarily for the novice. Since the legislature passed the law providing for a special season for archers to hunt deer with the bow a widespread interest has been created throughout Pennsylvania in bow hunting. Many hunters are attempting to learn the technique of shooting a bow and are handicapped in their efforts for the reason that they are not acquainted with any archers who reside in their vicinity on whom they can rely for instruction and advice.

New archery clubs have been formed with a membership consisting entirely of individuals anxious to learn the technique of shooting a bow.

The writer of this column has received numerous inquiries for information on publications on Archery, Range Construction, Tournament Rules, and Archery Associations etc. Technical questions are answered directly by the writer. Literature covering other subjects after requested is supplied through the courtesy of the Pennsylvania State Archery Association, Inc., P. O. Box 1294, Lancaster, Pennsylvania. This association has been active since 1931 in the State in promoting both Field and Target Archery. Several years' work was required for the association before the special archery deer season became a reality. The P.S.A.A. as it is called is a non-profit organization and affiliation with it keeps the individual archers and clubs informed on all phases of archery.

# *A Glossary of Archery Terms*

From the beginning in the February 1951 issue of the GAME News the column has attempted to inform beginners on how to select proper equipment and how to attain efficiency in the use of the bow. The nomenclature used in archery while familiar to the expert is unknown to the novice and an attempt has been made in the text to define each new term as it appeared in the text throughout the period in which the column has been written. This has been a continuous process and from inquiries concerning terms used in recent issues of the column in the GAME News the column editor has decided that it is time to publish a Glossary of Archery Terms in order that recent converts to archery will understand them as they reappear in the column.

### Glossary of Archery Terms

**Armguard:** A leather pad worn on the inside of the forearm of the bow hand to protect the arm from the slap of the bow string.

**Arrow Plate:** An inlay just above the handle on the side of the bow where the arrow passes as it leaves the bow.

**Ascham:** A cabinet in which bows, arrows and archery tackle are stored.

**Back:** The surface of the bow farthest from the archer when the bow is held in shooting position.

**Backing:** Various materials including: fibre glass, cellulose products, raw hide, etc. glued to the back of the bow to improve its cast.

**Backed Bow:** A bow to which a backing has been glued.

*Barb:* A projection on a hunting head which prevents its easy withdrawal.

*Barreled Arrow:* An arrow whose shaft is tapered from the middle toward each end and having its greatest cross sectional area in the middle of the shaft.

*Boss or Bast:* The twisted and coiled straw back of a target to which the face is attached.

*Bow Stave:* A billet of wood from which a bow is to be manufactured.

*Bowyer:* A maker of bows.

*Brace:* To string the bow.

*Belly:* The belly of the bow is the side that you see when you hold the bow in shooting position.

*Bend:* The act of bracing or placing the string in the bow nocks.

*Bobtailed Arrow:* An arrow that has its greatest cross section at the pyle end and tapers toward the nock.

*Bodkin:* A three bladed broadhead arrow.

*Broadhead:* A flat arrow shaped hunting head made of steel.

*Butt:* A back stop, such as bales of straw, to which faces are attached.

*Carriage Bow:* A bow that has its two limbs joined under the handle in a ferrule. It can be disjointed to permit easy transportation.

*Cast:* The inherent ability of a bow to propel an arrow.

*Chested Arrow:* An arrow that has its greatest cross section toward the nock and tapers from this point toward both the nock and pyle.

*Chrysal:* A compression failure i. e., a fracture of the fibres usually appearing as a line across the belly of the bow.

*Clout Target:* The standard (4) four foot target enlarged (12) twelve times and laid out in a horizontal position on the ground.

*Cock Feather:* The feather on the arrow which is at right angles to the nock. Usually the odd colored feather.

*Crest:* Colored bands of varying

width and spacing painted on the arrow for identification purposes.

*Crossbow:* A short bow set crosswise on a stock, drawn by mechanical means, and discharging a dart by trigger release.

*Cross Wind:* A wind blowing across the target.

*Curl:* A swirl in the grain of a bow stave.

*Down Wind:* A wind blowing toward the target.

*Draw:* The act of pulling the string the full length of the arrow.

*Drawing Fingers:* The first three fingers of the hand used in pulling the string.

*Drawing Weight:* The force in pounds required to bring the bow to full draw.

*Drift:* The sidewise movement of the arrow as it travels toward the target due to a cross wind.

*End:* A unit number of arrows used in scoring. In target competition six arrows constitutes an end.

*Eye:* The loop or loops in a bow string.

*Field Captain:* The official in charge of a tournament.

*Finger Tips:* Leather finger stalls to protect the tips of the three shooting fingers.

*Fistmele:* The distance from the base of clenched hand to the tip of the extended thumb. Used as a measure of the proper distance from the handle to the string when the bow is braced or strung.

*Fletch:* Placing the feathers on an arrow.

*Fletcher:* A manufacturer of arrows. (Arrow maker).

*Fletching:* The feathers which guide the arrow in flight.

*Flight Arrow:* A long, light arrow with very small fletching or vanes. Used in distance shooting.

*Flirt:* A jerky or jumping movement of an arrow from its theoretical flight line.

(To Be Continued)

# The Unwanted Catch

By L. J. Kopp

## PART 1

**W**AYS and means to avoid catching unwanted animals presents subject which trappers have been experimenting with for many years. Contrary to what some people think trapper does not just set a trap and take whatever happens to get caught in it. Instead he sets a trap for a specific animal.

On top of the list of unwanted animals we would find the dog. This includes the half wild stray as well as the farmer's "stay at home" dog who frequently roams beyond the home grounds.

Foxes and dogs have many habits in common. Both animals are attracted to scent and bait from a long distance, and because of their nature, any bait or scent which will attract a fox will also attract a dog.

One solution is to make two buried bait or dirt hole sets several yards apart; one set is baited the other is left as it is. The trap is set in the unbaited set. A dog naturally comes to the baited set, but it is likely that he will not bother the one that contains the trap. This is not a foolproof set, however, for there still remains the possibility of catching a dog, and in the same breath there is the possibility of missing a fox.

Using water sets for foxes is another idea advanced by some trappers to prevent catching dogs. This too has its advantages and disadvantages similar to the double bait hole set.

The stepping stone set made in water will catch foxes to be sure, but insofar as catching dogs it is not foolproof. In addition, not all trappers operate in areas where a sufficient number of water sets could be made in order to assure reasonable success.

Another good idea for a set requires an ant hill or similar mound of earth. The trapper makes his dirt hole and places the bait about ten or fifteen feet away from such a mound. The trap is set on the mound of earth or ant hill rather than at the bait. The idea behind this set is that there is sometimes a slight difference between the habits of the fox and dog; a fox is much more likely than a dog to step upon or sit on top of such a mound. The main thing is that you have a suitable mound at the proper location. If not, you are out of luck, unless you make one.

Skunks, opossums, and raccoons are next on the fox trapper's list of unwanted animals. Actually, because of their numbers these pests cause trappers a great deal more concern than with dogs. Catching ten or fifteen 'possums to one dog would, I believe, be a mild guess. Within recent years, coon and skunks have increased to above normal populations in many parts of the State, and as a result are causing fox trappers much unnecessary work and headaches!

The sets which I described previously also apply here. A properly made water set for fox will usually prevent taking skunks and 'possums, but it will not prevent a coon from getting into your trap. On the other hand, the mound set and the double bait set will usually eliminate coons as well as skunks and 'possums.



Some fox trappers I know have suggested placing the scent or lure some distance away from the set, in

### DATES SET FOR TAXIDERMY EXAMINATION

On July 9 and 10 the Taxidermy Examination board will meet in the Commission's Harrisburg offices to interview applicants for Taxidermy Licenses. The board consists of the following representatives of the Commonwealth's leading museums:

Harold T. Green, Academy of Natural Sciences, Philadelphia; James Wosincki, Carnegie Museum, Pittsburgh; and M. J. Kelly, Everhart Museum, Scranton.

At the time of this writing six applications have been received and several more are expected before the examination date.

a small hole dug in the ground, or on a stump or dry snag on a nearby tree or bush, and using a sweet smelling bait such as cracklings, or fresh untainted meat, in the bait hole at the set proper. Fox urine is then used at the set to attract the fox once the lure has called him into the vicinity. The idea is that such bait does not attract other animals as readily as loud smelling bait would.

This is a practical method, but I have found that even fox urine is attractive to animals such as skunks, coon, and 'possum. As a result they are frequently caught even though such precautions are observed.

Many trappers claim that by tightening the pan action on their traps they avoid small animals such as skunk and 'possum entirely. It is tightened so that it will require a pressure of from one to two pounds before releasing, the idea being to

hold the weight of small animals without tripping the pan. In time the trap pan action must again be adjusted as it has a tendency to become loose. Overall the idea is a good one.

Thus far the problem of avoiding unwanted animals has been viewed more or less from the fox trappers viewpoint. It is a little more complicated and far reaching, however.

For example, take the matter of catching illegal muskrats in coon sets along streams, or muskrats in mink traps illegally.

To avoid catching muskrats in coon traps, sets can be made several feet back from stream banks. A dirt hole or bait hole set is made the same as you would for fox, except that for coon a set can be made at the base of a stump or tree. Sardines or any other kind of fish together with good coon scent will attract any passing coon to your set.

However, a trapper does not like to pass up an ideal trap site where coon are forced to enter the water in order to get around a rock or base of a tree, and in such instances traps should be set in at least six inches of water, allowing a muskrat to swim over the trap unharmed.

Mink trappers I know claim minks can be called to bait sets made some distance from the stream, by using fresh tame rabbits or chicken blood. Then, too, many minks are caught in streams where few or no muskrats exist.

While on this subject of avoiding unwanted animals it might be a good idea to explain that a lot depends on how well you know your trapping territory, animal habits, feeding spots, and the various trails travelled by the various animals. A thorough knowledge of these things goes a long way towards helping you decide where to set traps for various animals without catching so many of the unwanted.

(To Be Continued.)

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J. B. SEDAM .....	<i>Supervisor, Food &amp; Cover Section</i>

### Wildlife Protection Division

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H. T. ENGLERT .....	<i>Asst. Chief</i>
HAROLD L. PLASTERER .....	<i>Supervisor, Bounty Claims Section</i>

### Game Propagation Division

EARL S. GREENWOOD .....	<i>Chief</i>
RALPH E. BRITT .....	<i>Game Propagation Consultant</i>

## WILDLIFE CONSERVATION DIVISIONS

### (Field)

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Phone: 4-2661

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NORTHEAST DIVISION—C. C. Stainbrook, Supervisor, 987 Wyoming Ave., Forty Fort.  
Phone: Kingston 7-6193

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NORTHCENTRAL DIVISION—M. E. Sherman, Supervisor, 214½ E. Water St., Lock Haven.  
Phone: 5400

Cameron, Centre, Clearfield, Clinton, Elk, Lycoming, McKean, Potter, Tioga, Union.

SOUTHCENTRAL DIVISION—A. G. Logue, Supervisor, 327 Penn St., Huntingdon.  
Phone: 872

Adams, Bedford, Blair, Cumberland, Franklin, Fulton, Huntingdon, Juniata, Mifflin, Perry, Snyder.

NORTHWEST DIVISION—T. A. Reynolds, Supervisor, 14 W. 1st St., 2nd Floor, S.S., Oil City. Phone: 4-6281

Butler, Clarion, Crawford, Erie, Forest, Jefferson, Lawrence, Mercer, Venango, Warren.

SOUTHWEST DIVISION—G. L. Norris, Supervisor, 331 E. Main St., Ligonier. Phone: 519  
Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington, Westmoreland.



## Prayer of an Outdoor Man

I thank Thee for the out-of-doors;  
I thank Thee for the solitude of wild places, the strength of the hills and the calmness of quiet streams;  
I thank Thee for old clothes, rough work, and the right to let my beard grow;  
I thank Thee for the curling smoke of a campfire in the early morning;  
I thank Thee for steaming coffee, sizzling bacon and an outdoor appetite;  
I thank Thee for the swish of my paddle, and the joy of watching fleecy clouds roll by;  
I thank Thee for the call of a whippoorwill at dusk across a silent lake;  
I thank Thee for silvery moonbeams on rippling water;  
I thank Thee for the singing of my reel and the bending of my rod as a big one strikes;  
I thank Thee for the contentment that comes with the patter of rain on my tent at night;  
I thank Thee for wild blackberries along an old stump fence;  
I thank Thee for my dogs, my gun, and the flaming colors of the autumn woods;  
I thank Thee for wild ducks flying South against a dull gray sky;  
I thank Thee for the glory and majesty of the stars;  
I thank Thee for strong winds pulling at my hair roots and the spray from the lake on my cheeks;  
I thank Thee for old trails, for rocks, for raging rapids and a glimpse of deer drinking in a secluded pool;  
I thank Thee for the drum of the partridge, for squirrels, trailing arbutus, the aroma of pine needles, sunshine through the leaves, and all the other eternal miracles of the out-of-doors.

PENNSYLVANIA

# Game News

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# THE STORY BEHIND THE COVER

**I**F there's a more excitable creature in Pennsylvania than the red squirrel I've no desire to meet it. Merely step into his pine woods domain and he will give you a tongue lashing you'll never forget. At his first glimpse of you he will leap into the nearest tree and set up a chirring sound designed to announce your presence to everyone in squirreldom. Make a move toward him and his excitement reaches fever pitch. Jerking his tail and stamping his feet he gives vent to a medley of chirrs, chirps and squeaks all out of proportion to his size. I've never actually seen a red squirrel explode, but strongly suspect that it could happen.

The red squirrel is a cute critter, all right, and his comical antics are an endless source of pleasure to the outdoorsman. However, he sometimes acquires the distasteful habit of eating bird eggs and fledglings—a degree of omnivorousness that is partially responsible for the leniency of the laws that protect him. His usual fare consists of nuts, seeds, mushrooms, berries and fruit, with nuts and certain seeds on the preferred list. Conspicuous evidence of a red squirrel population is the presence of large heaps of the remains of tulip tree seeds often found at the base of Reddy's tree stumps and cafeteria.

As a game animal the red squirrel can't hold a candle to his larger gray cousin. He's just as delicious, but his small size makes a discouragingly small lump in the game pocket. To make matters worse, his quarrelsome nature is sometimes the reason for the disappearance of the much preferred gray squirrels from certain areas.

The red in the cover photograph is attired in his winter coat, characterized by its grayer tone, dense texture and long hairs on the ears. After shedding in the spring Reddy wears a short, sleek coat of rich reddish brown, with no hint of ear tufts.

He is found in practically all portions of Pennsylvania, although woodsy creek bottoms or coniferous woods seem to be preferred. Reddy's wants are simple—he really doesn't expect too much from life. Just give him a stand of tulip trees and birches, a smattering of pines, a reasonable amount of food and an occasional fox, dog or man to insult, and he's happy as a lark.

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No. 5

by the

Pennsylvania Game Commission

Commonwealth of Pennsylvania

JOHN S. FINE, GOVERNOR



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Cover Photo

by

Ralph M. Cady



Photo by Delbert Batcheler

# *Editorial*

LAST month the eyes of Pennsylvania's hunters and trappers were focused on Harrisburg, where the Game Commission was completing its annual task—that of setting the seasons and bag limits on game animals, game birds and furbearers.

No cracker barrel discussion is complete without the age-old question, "How can a couple fellows in Harrisburg say how many deer or rabbits or other game can be shot?" Without a doubt, it's been asked often enough to warrant a reply.

In the first place, our Game Commissioners are not actually located in the Capital City; they are scattered throughout the state, one in each of eight geographical sections. Each is well-informed on the game populations and hunting trends in his own locality, as well as in the state as a whole. Several have gained world-wide recognition as leaders in the conservation field.

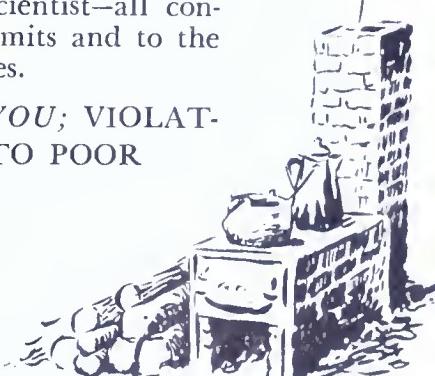
In the second place, the Commissioners do not blindly follow their own individual theories. For a more comprehensive picture of state-wide wildlife conditions they accumulate additional information from various sources. For instance, our Game Protectors and other field men periodically submit detailed reports on game populations, food and cover conditions, hunting pressure, etc., in their districts. Other Commission personnel collects valuable data that may help influence the length of open seasons and the size of the legal "take."

Before arriving at a final decision the Commission meets with representatives of organizations interested in various phases of hunting, trapping and game management who present their views and problems. Represented at last month's meeting were organized and unorganized sportsmen, archers and bow hunters, waterfowl hunters, trappers, a college research unit and a Federal forest management agency.

Although most outdoorsmen express their opinions through sportsmen's organizations, it is the privilege of each and every individual to submit his personal views and recommendations, which are likewise given careful consideration by the Game Commission.

In other words, controls are adopted by the Commission only after listening to and considering every report and suggestion that it receives or can obtain. The muskrat trapper, the dog lover, the squirrel hunter, the Game Protector, the trained scientist—all contribute their bit to the setting of seasons and bag limits and to the formulation of sound wildlife management practices.

**GAME LAWS AND REGULATIONS BENEFIT YOU; VIOLATING THEM IS THE SHORTEST ROUTE TO POOR HUNTING.**



# What Price Venison?

By Robert S. Bell



Ned Smith

Whatever your favorite method of hunting, Bob Bell's experiences should give you a chuckle or two.

IT was cold, colder than a witch's nose in a blizzard. Of course, a witch would probably have had more sense than to go stumbling around in a blizzard—but not me! Oh, no. Just 'cause the bottom had fallen out of the thermometer and the wind was blowing thirty miles an hour was no reason to stay home in bed when I could be deer hunting. Maybe it wasn't snowing. I wasn't quite sure at the time. You see, the sun wasn't up yet so I couldn't see very well but something cold and wet kept hitting me in the face. I assumed it was snow.

Over the previous month or so a friend—this is using the word loosely—had spent considerable time telling me the advantages of hunting deer by what is known as "driving" as

compared with still-hunting. At first mention of the word it appealed mightily. "Must drive around the mountains and shoot 'em out of the window," I thought. Then I remembered something. "But isn't that way of hunting slightly illegal in Pennsylvania?" I asked him. At this he looked confused so I told him what I'd been thinking. Then he explained what he had really meant by driving. If there should be among you any deer-slayers who are not familiar with this time-honored Pennsylvania method of deer hunting I will herewith enlighten you.

To indulge in this kind of hunting the first thing necessary is a bunch of hunters—a big bunch. If you belong to a gun club of any sort you should be able to talk a number

of them into a few days of deer hunting without too much trouble. Assuming that you have collected a couple dozen men the next step is to divide them into two groups of ten or twelve each. One of these groups is known as the '*drivers*' and the other as the '*watchers*' or '*standers*'. '*Watchers*' is probably more correct for we have occasionally seen '*standers*' sitting down—in which case they would probably be referred to as '*sitters*'. To keep it simple and avoid confusion we'll call them '*watchers*' from now on. Admittedly this is a small point to quibble over but all the old deer hunters keep insisting it's the little things that are important when it comes to bagging some venison.

Now the duties of the *watchers* are probably self-explanatory. They are stationed on runways or points where previous hunting experiences have shown deer tend to pass; the idea being to shoot one when he does so. The purpose of the *drivers* is also simple—at least in theory. All they have to do is herd the deer up to the *watchers*. It isn't necessary to segregate bucks and does.

It would be well to mention here that it is best to have one man appointed leader of each of these groups so that between them they can decide where the watch shall be placed, what direction the drive will come, when it will start, etc. Unless this is done every hunter present will have his own ideas about what is going on, no two ideas are ever alike.

When all details have been settled the leaders of the *watchers* takes his men to their posts in a roundabout way so as not to disturb any game in the area and they wait for the *drivers* to come through.

Now get this straight—the *watchers* try *not* to scare the game and the '*drivers*' do just the opposite. This doesn't seem complicated but it gets that way soon, because you will alternate jobs. In other words, one time you will watch and the next time you

will drive. At least that's the idea of the thing but it doesn't always work out that way for soon someone will get too cold to take his turn on watch and swap jobs with a driver—out of turn, of course—which can foul up the works. Especially if several of them do it at once.

Therefore, remember your job and don't swap with another fellah who's doing the same thing as you. Things are confused enough already.

I hope that by now you know what is meant by '*driving*' deer and so will be able to talk of it intelligently when next you meet someone who obtains his venison in this manner.

To get back to the beginning of this little piece, you will remember the hero (played by me) was slowly congealing while waiting for the two leaders—should we call them co-captains?—to decide who should drive and who should watch. Eventually they settled it without quite coming to blows and a number of nimrods, including yours truly, were informed that we were to be the first watch. Whether this is an advantage or not I don't know. Anyway, we fell in single file and started up and around the mountainside. After about a quarter of a mile some feeling returned to my toes and by the time I'd reached my stand I had worked up a sweat and had to open the heavy wool shirt I wore. (Over two sweaters and wool underwear.)

The leader pointed up in a tree to a couple sticks nailed to form a seat. "You climb up there to watch," he said, "you'll be able to see more than from the ground." I managed to get there without dropping anything and settled down to wait for the '*drivers*' to chase a deer up to me. At first everything was swell. I was sitting down, I was warm and I was going to kill a deer. A very agreeable situation. But after a few minutes I began to feel a little cool. Then I felt rather cold. My clothes were wet from perspiration and the wind chilled me through. Soon I be-

gan to shake and almost shivered off my perch.

When the drive finally came through I hadn't seen a single deer. They probably heard my teeth chattering and went around 'cause the kid at the next stand emptied his .35 Remington twice. The way he pumped 'em out it sounded like a Schmeisser machine pistol. Didn't hit anything but it was easy to see which way the deer had gone for he'd cut down all the saplings for a hundred yards. Lucky he was too young to acquire any GI habits or he'd still be polishing brass. That night I decided, after serious consideration, that I just wasn't built long enough in the legs for this 'driving' business so declined their invitation to try it two days in a row. Instead, the next morning I slept late, ate a leisurely breakfast, then drove a few miles from town. After parking I walked down a dirt road a few hundred yards and sat down on a stump. (Still recuperating from the previous day!)

From my seat I could watch a fairly open hillside and the place where two small valleys joined. I had been there only a few minutes when I saw

something move in a corner of woods about ninety yards away. Looking closely I could see a nice rack and the head of a deer. Easing the big Winchester to my shoulder I tried to find his neck in the Texan 'scope as he moved slightly, but couldn't make it out, so I dropped the post down to where I thought his shoulder should be and shot.

As I worked the lever I saw him jump forward, his near front leg broken just beneath the body. He cut across the open place and I put a 200 grain slug through his shoulders, piling him up in his tracks. This .348 is kinda hard on meat sometimes but it's sure a killer!

I dressed him out, dragged him about forty yards to the dirt road and drove the car down to pick him up. He was hanging up in the yard before dinner time.

Well, there you have it. You can see for yourself all the advantages "driving" has over other methods of deer hunting so I won't bother listing them again. Just get your gang and go to it. But please don't wake me on the way out!

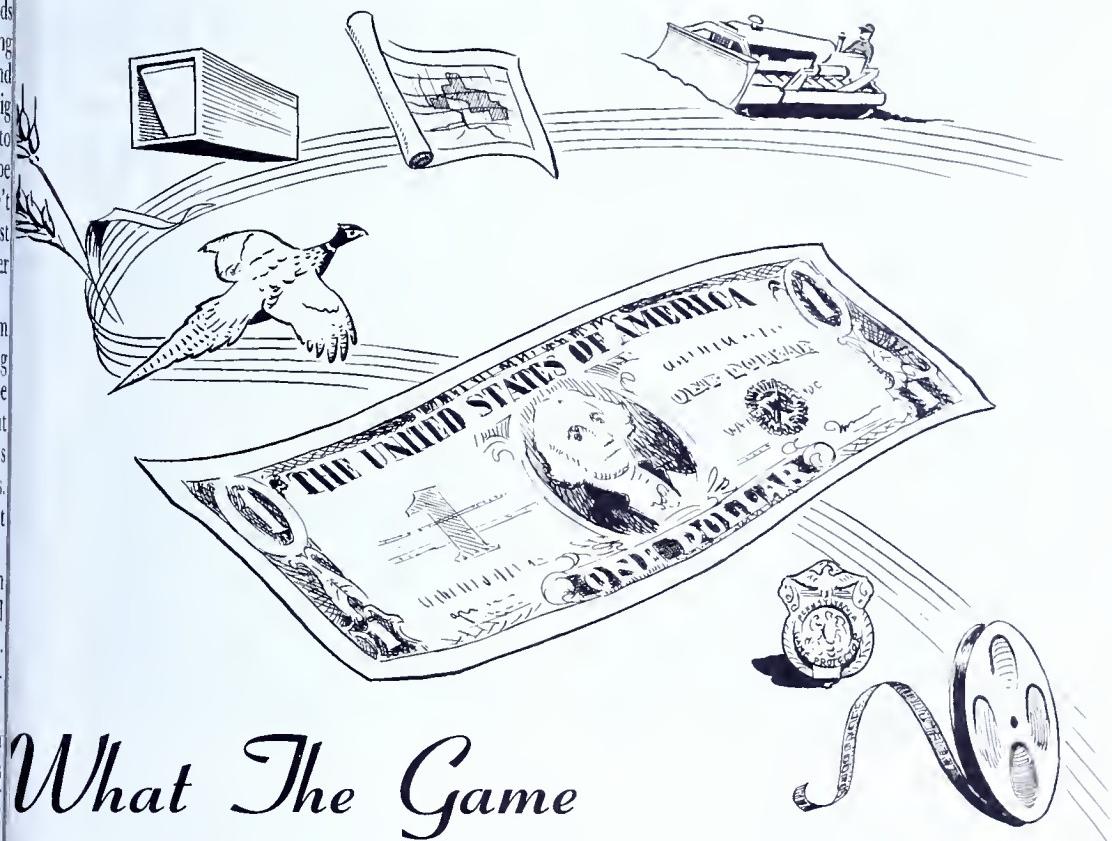
. . . *The End.*

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### SHOOTING SAFETY FILM AVAILABLE ON LOAN BASIS

An excellent film called "Shooting Safety," produced by the Sporting Arms and Ammunition Manufacturers' Institute, now is available on a free loan basis. This film is ideally suited for showing at boy's camps and meetings of youth groups.

Winner of the only honorable mention award in the general safety film classification of the National Safety Council competition, "Shooting Safety" is a full-color sound production. Until recently it has been available only on a sales basis but may now be obtained by responsible organizations without charge except for transportation costs each way. The story is concerned with the action taken by a parent faced with deciding when his boy will be old enough to have a gun. Intelligently approaching the problem, he enlists the aid of qualified citizens in his community and forms a basic shooting school for youngsters. The action and dialogue get across to the viewers many important lessons in the safe and sane handling of firearms. Requests should be addressed to the FILM LOAN SERVICE Sportsmen's Service Bureau, 343 Lexington Avenue, New York 16, New York.



# *What The Game Fund Dollar Does*

By N. E. Slaybaugh, Comptroller

A Report on the Finances of the Game Fund During the Fiscal Year

June 1, 1951 to May 31, 1952

AS I started to write this report on this, a typical June day, it was gratifying to let my thoughts revert to the pleasant days field during the 1951 hunting season, then to look forward in anticipation to the 1952 season. Doubtless at this time of the year such experiences are shared by thousands of others—both reminiscing and anticipating.

While the purpose of this report is to give the financial operations for the fiscal year which ended May 31, 1952, your Commission during any fiscal year is not only thinking and planning for a successful hunting season, but also of what can and must be done with the funds available to pro-

vide good hunting in the years that lie ahead. Fortunately, many sportsmen and others interested, are teaming up with the Commission in this much broader aspect of the entire conservation program.

The farmers, who are hosts to approximately one million hunters annually, play a very important part in the overall program, and it is to them that the hunters are greatly indebted. Many sportsmen today, and happily the number is increasing, appreciate more than ever the value of good farmer-sportsmen relationships. This is evidenced by respecting the rights of the property owner, and helping to make un-

popular and punish those (a small minority) who still have no regard for the rights of the farmer.

Every citizen has at least two outstanding responsibilities to his government. They are: (1) Exercising his franchise to vote in the various elections and (2) concerning himself about wise and judicious spending of public funds. Therefore, it is not at all unusual for sportsmen to question the manner in which the Game Fund is spent. With few exceptions, one general explanation answers most of the questions, namely, the Commission must plan its program and spend the money placed at its disposal on a State, rather than a local level, as its sole purpose is to accomplish the most and best for the greatest number of people. Naturally, a management plan of this kind brings disappointments to those sponsoring projects on a local level which do not key into the State plan. Notwithstanding the success of the best laid plans, the payment of license fees alone will never do all that must be done to preserve our great heritage—hunting as we have and enjoy in America. The sportsmen and allied interests recognized this fact years ago. The splendid contribution they are making today, which supple-

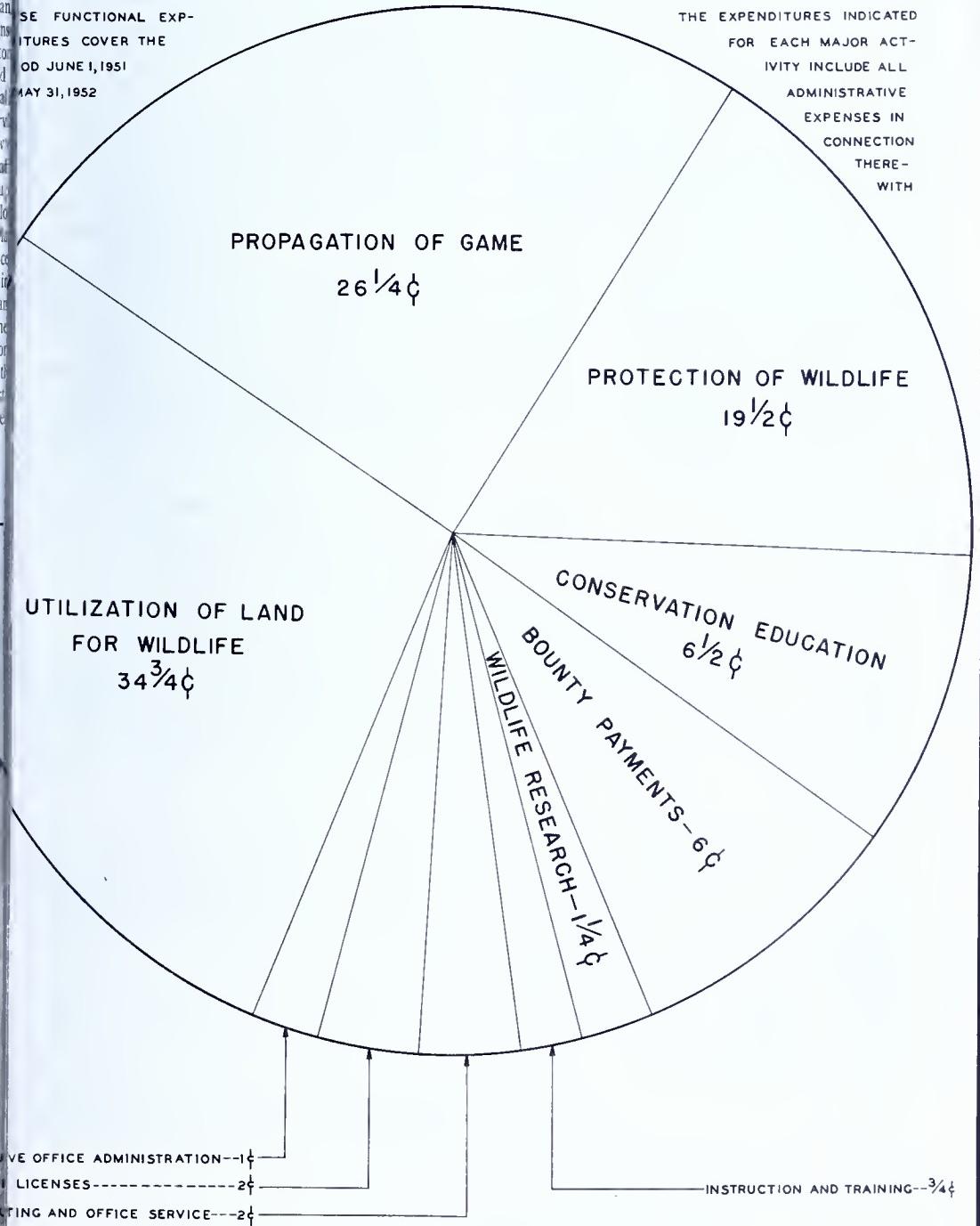
ments the work of the Commission, is well known to all. It represents the difference between success and failure, the difference between enjoying our rather satisfactory population of wildlife compared with either no or very little.

It is not my intent to go beyond the dollar and cents part of the conservative program. As important as that part is, the other side is knowing what a rich wildlife heritage we possess here in Pennsylvania. The average citizen knows that in Pennsylvania today we have a well-trained corps of Game Protectors, many times referred to as Game Wardens, but he does not realize that the long hours of continuous service of such officers reduce their hourly wage much below that of most other skilled craftsmen engaged in far less hazardous occupations. Therefore, it is obvious that the love of and interest in wildlife conservation plays an important part in keeping these officers in the service of the State. Game Administrators and field employees are in the same category, in that they give freely of their time, and in many instances much beyond the call of duty. Last, but not least, the sportsmen of Pennsylvania are very fortunate in having eight public spirited citizen

Table No. I  
SUMMARIZATION OF EXPENDITURES BY FUNCTIONS  
FISCAL YEAR ENDING MAY 31, 1952

	Part of dollar
Utilization of Land for Wildlife Management of State Game Lands, Cooperative Farm-Game Projects and other leased areas totaling 2,058,212 acres. Also payments in lieu of taxes ..	\$1,475,509.19      34¾¢
Propagation of Game, Operation of game farms, purchase of game, wild game transfer, distribution of game .....	1,116,321.98      26¼¢
Protection of Wildlife, Salaries and expenses for enforcement of game laws, assistance in enforcement of fish, dog and forest laws and numerous other field activities .....	827,207.60      19½¢
Conservation Education, Game News, publications, exhibits, motion pictures, radio broadcasts, attending Sportsmen's meetings, etc. .....	278,118.88      6½¢
Bounty Payments, Bounties on noxious animals including administrative expenses relating thereto .....	247,792.11      6¢
Wildlife Research, Wildlife studies to determine practical methods for developing management programs .....	54,160.27      1¼¢
Instruction and Training. Refresher courses and instruction for all salaried field employees and some Deputy Game Protectors, also includes normal maintenance expense and enrollment on May 25th of the 7th class of student officers .....	32,347.67      ¾¢
Executive Office. Accounting and Office Service (\$217,159.31 subdivided below):	
Accounting and Office Service. Audit of accounts and book-keeping, personnel matters; supervision over purchases, equipment and supplies .....	93,632.68      2¢
Hunting Licenses. Including tags, applications, reports .....	87,063.08      2¢
Executive Office. Administration, Salaries and expenses of Executive Office and expenses of Commissioners .....	36,463.55      1¢
Total Expended for all Purposes .....	\$4,248,617.01      100¢

# HOW THE GAME FUND DOLLAR WAS USED



who are willing to serve as Game Commissioners, looking after the interests of the sportsmen, and the State's wildlife without compensation. They give freely of their time, effort and money for the benefit of wildlife, and all the people of our State.

When reduced to simple terms, our financial picture is not complicated. Therefore, for the year beginning June 1, 1951 and ending May 31, 1952 we relate the following story:

At the beginning of the year there was a cash balance in the State Treasury in the amount of \$1,490,933.16.

During the year we received monies from various sources which were deposited in the Game Fund, as follows:

Hunters' Licenses (including Resident, Nonresident, Antlerless Deer and Archery) ....	\$3,266,841.88
Game Law Fines .....	146,497.25
Special Game Permits (Fur Dealers, Taxidermists, Game Propagators, etc.) .....	18,370.00
Interest on Game Fund Deposits	13,151.13
Sale of Forest Products from Game Lands .....	48,998.55
Sale of Animal Skins .....	9,070.19
Sale of Unserviceable Property and Equipment .....	4,520.04
Rental from Commission-owned Buildings and Rights-of-Way	27,417.43
Sale of Publications (principally GAME NEWS subscriptions) .....	37,477.72
Federal Aid for Wildlife Purposes (75% of Cost of Approved Projects) .....	457,777.89
Redemption of War Bonds .....	93,000.00
Miscellaneous Items .....	24,131.11
Total Receipts from all sources deposited in the Game Fund during the year .....	\$4,147,253.19

With the amount on hand at the beginning of the year (\$1,490,933.16) and what was deposited during the year (\$4,147,253.19) there was accumulated from all sources \$5,569.34.

During the year \$4,248,617.01 of the total sum accumulated was spent for the following purposes:

Executive Office, Accounting and Office Expenses .....	\$ 217,159.31
Research for Wildlife Improvement .....	54,160.27
Conservation Education .....	278,118.88
Training of Personnel, including expenses incident to enrollment of Class of Students May 25, 1952 .....	32,347.67
Land Utilization Operations ...	1,475,509.19
Propagation, Purchase and Distribution of Game .....	1,116,321.98
Wildlife Protection including Law Enforcement .....	827,207.60
Payment of Bounty Claims and Administrative Expenses Relating Thereto .....	247,792.11
Total .....	\$4,248,617.01

#### MAY 31 CASH BALANCE

This year, as during the preceding years, all bills were paid by the Treasury Department as of May 31, 1952, thereby automatically bringing the accounts of the

Commission and Treasury Department in complete agreement. Since there was accumulated \$5,638,186.35 and there was spent \$4,248,617.01 we came to the end of the fiscal year with a cash balance of \$1,389,569.34. We are certain that this system is serving its purpose, namely, eliminating any confusion about the true cash balance in the Game Fund at the end of any fiscal year May 31.

Sportsmen, especially new subscribers, are often confused about the need of a large cash balance at the end of each fiscal year. They say "Why do you need a large cash balance as of May 31 each year?" "Why don't you spend it?" The explanation is simple—during the months of June, July, August and September of each year, the work must go on and be paid for as usual but that is a very lean period for receipts. The bills to be paid during those four months are about \$1,000,000 more than the money received for the same period, so instead of spending all the money accumulated each fiscal year, a sufficient sum must always be saved to pay the bills from June 1 to September 30. By October 1 each year the new license money starts to come in and from that time there is sufficient money received currently to finance the program undertaken to the end of the fiscal year. Previously the amount was about \$800,000 which is no longer sufficient to cover the expanded program. In other words, the larger the program becomes, the more funds are necessary to pay the bills on a current basis.

The \$1,000,000 provides only for the usual expenditures during this period but nothing for emergencies that could arise. What do you suppose would happen if the opening of the hunting season were delayed? Proclamation of the Governor due to extremely dry forest and field conditions which could result from a prolonged drought? Could easily delay the receipt of monies and develop a very serious financial situation since the Commission has no means by which it can borrow any money for any purpose at any time. These facts should make any person realize that the Commission must be both businesslike and careful in its financing.

The difference between our minimum working capital of \$1,000,000 and the May 31, 1952 cash balance of \$1,389,569.34 or about \$389,570.00 consisted of unexpended budget balances and actual revenue in excess of budget estimate. In line with an established policy all of this cash balance has been absorbed in the budget for the year beginning June 1, 1952.

#### AUDIT OF GAME FUND

Questions concerning any published report, such as "Are the figures correct?" or

"Are the accounts in order?" are timely and certainly apply to the Game Fund.

By an Act of General Assembly, the Auditor General is required to audit State Departments, Boards and Commissions. At the time this article went to press no formal audit for the period had been made. However, every bill is audited by the Auditor General before payment is made. The application of sound management and business practices employed by the Commission is further attested to in the audit reports for the seven previous years, six of which contained no criticism or suggestions for improvement, and one which contained two suggestions of a minor nature. The same high standards were maintained during the year reported herein, and it is reasonable to assume that the audit, when made and a report filed, will show that the affairs of the Commission were handled in an equally efficient manner. We try to improve our operating machinery constantly. The foregoing is the simple story of our finances for the last fiscal year.

#### NOW FOR THE DETAILS

Our Annual Report must satisfy not only the persons who want a quick picture but

also those who desire details. It is believed the foregoing material will meet the requirements of the first group. However, for the benefit and information of the latter group, certain statements and charts are made available with this article. By looking at the chart and referring to Table No. 1, you will find in greater detail the functions for which the monies were used and the number of cents of each dollar expended that was used for each purpose.

By referring to Table No. 2, you will find the cash balances in the Treasury Department at the beginning and ending of the fiscal year, the receipts from the various sources during the year and the total funds available during the year. It also shows the various classifications of expenditures that comprise the total cost of each organizational unit as well as the total spent by all units for each classification.

#### STATE-WIDE FIELD OPERATIONS

Over one-half of the Game Fund expenditures is spent for land utilization and wildlife protection operations, including law enforcement—all field activities. Believing there is a general interest in the field operations and the amount spent for each activity, we are giving below supporting details:

#### WILDLIFE PROTECTION

Game Law Enforcement on a State-wide Basis .....	\$ 468,367.42
Proportionate Share of Field Division Office Administration .....	54,965.88
Various kinds of essential field services not directly chargeable to items herein set forth .....	37,054.88
General Administrative expenses chargeable to Wildlife Protection .....	42,057.95
Activities in connection with the control of predators .....	22,403.14
Cooperating with Conservation and Law Enforcement Officers .....	17,310.26
Investigating Game Damage Complaints .....	19,934.97
Payment to Retirement System for Employees .....	28,598.86
Cost of Issuing Special Permits of Various Kinds .....	5,658.86
Control of Rabies .....	130,855.38
Total Cost During the Fiscal Year for this Purpose was .....	\$ 827,207.60

#### LAND UTILIZATION

Food and Cover Projects on State-owned Lands .....	\$ 497,684.95
Maintenance and Development of State Game Lands and Primary Refuges .....	298,461.55
Purchase of Land, including Title and Survey Costs .....	31,732.30
Development and Operating Farm-Game Projects .....	97,471.38
Establishing and Maintaining Farm-Game Projects .....	77,983.09
Protecting Farm-Game Projects .....	33,299.77
Proportionate Share of Field Division Office Administration .....	82,448.82
Conservation Development Work in Cooperation with Federal Government .....	25,609.51
Purchase of Equipment (trucks, tractors, graders, etc.) .....	32,757.39
Feeding of Game in the Wild .....	69,159.84
General Administrative Expenses Chargeable to Land Utilization .....	67,190.19
Various kinds of essential field services not directly chargeable to items herein set forth .....	37,724.41
Maintenance of State Game Propagation Areas .....	12,428.89
Waterfowl Impoundments and Resting Areas .....	8,633.43
Payments to Retirement System for Employees .....	14,836.50
Building Construction on State Game Lands .....	13,843.09
Establishing and Maintaining Rabbit Farms .....	71,218.61
Maintenance and Development of Auxiliary Game Refuges on Privately-owned Lands .....	1,604.66
Maintenance of Dog Training Areas .....	1,420.81
Total Cost during the Fiscal Year for this Purpose was .....	\$ 1,475,509.19

TABLE NO. 2

**PENNSYLVANIA GAME COMMISSION**  
**STATEMENT OF REVENUE, EXPENDITURES AND CASH BALANCES**  
**FISCAL YEAR JUNE 1, 1951 TO MAY 31, 1952**

REVENUE	\$
Cash in State Treasury to credit of "Game Fund" June 1, 1951 .....	1,490,933.16
Receipts June 1, 1951 to May 31, 1952:	
Hunters' Licenses (including Resident, Nonresident, Antlerless Deer and Archery) .....	\$3,266,841.88
Game Law Fines .....	146,497.25
Special Game Permits (Fur Dealers, Taxidermists, Game Propagators, etc.) .....	18,370.00
Interest on Deposits .....	13,151.13
Sale of Forest Products from Game Lands .....	48,998.55
Sale of Animal Skins .....	9,070.19
Sale of Unserviceable Property and Equipment .....	4,520.04
Rentals from Buildings and Land .....	27,417.43
Sale of Publications .....	37,477.72
Federal Aid for Wildlife Purposes (75% of cost of approved projects)	457,777.89
Miscellaneous Items .....	24,131.11
Redemption of War Bond Investment .....	93,000.00
Total Receipts from All Sources .....	4,147,253.19
Total Funds Available during Year .....	\$5,638,186.55

CLASSIFICATION OF EXPENDITURES BY ORGANIZATIONAL UNITS

	Exec. Office and Acctg & Ser.	Game Propagator	Wildlife Research	Land Utilization	Wildlife Protection	County Claims	Conser- vation School	Conser- vation Education	Total
Classification of Expenditures									
Salaries .....	\$91,151.84	\$131,571.61	\$32,813.03	\$215,332.48	\$454,435.00	\$15,387.73	\$14,378.15	\$70,311.65	\$1,025,331.49
Traveling Expenses of all kinds, including auto mileage .....	5,102.40	28,106.66	6,408.45	56,612.07	164,556.20	943.08	917.81	14,653.08	277,329.75

	2B,102.40	2B,102.66	6,40B-45	5G,61G2.07	1G,55G.20	1A,55G.03	2A,77.32D.03	1A,653.08	2A,77.32D.75
Deputy Game Protectors (Wages and Expenses) .....	.....	.....	.....	.....	101,094.62	.....	.....	.....	101,094.62
Cooperative Farm-Game Program (Total Cost) .....	124,915.00	.....	208,754.24	.....	.....	.....	.....	.....	333,669.24
Wages (Land Management, etc.) .....	4,465.09	.....	763.38	503,037.71	21,436.03	.....	4,935.15	6,902.94	541,545.30
Wages (Game Farms, etc.) .....	188,316.69	.....	.....	.....	.....	.....	.....	.....	188,316.69
Purchase of Game .....	138,532.60	.....	.....	.....	.....	.....	.....	.....	138,532.60
Rabbit Trapping and Wild Game Transfer .....	64,522.52	.....	.....	.....	.....	.....	.....	.....	64,522.52
Feed (for Game Farms and Game in the Wild) .....	267,158.99	.....	34,344.27	.....	.....	.....	.....	.....	301,648.30
Express and Cartage .....	12.09	920.39	302.22	2,096.15	1,794.17	75.51	12.93	574.78	5,788.24
Purchase of Lands (title and survey included) .....	.....	.....	31,732.30	.....	.....	.....	.....	.....	31,732.30
Payments in Lieu of Taxes to Local Taxing Units .....	210.09	.....	.....	66,638.44	.....	.....	.....	.....	66,848.53
Building and Construction (mostly on Game Farms) .....	67,889.61	.....	13,843.09	.....	.....	.....	.....	.....	81,732.70
Repairs to Buildings, Grounds and Equipment by Contract .....	156.39	4,346.77	.....	2,746.72	39.73	.....	2,131.93	675.27	10,096.81
Equipment (mostly for Land Management and Game Farms) .....	1,317.92	4,868.42	94.66	32,757.39	1,118.79	1,614.00	351.63	8,894.95	51,017.76
Miscellaneous Supplies .....	3,700.09	34,147.03	380.43	151,053.09	8,190.35	155.92	5,118.91	29,741.07	232,486.89
Motor Supplies .....	1,118.48	17,231.65	.....	41,199.73	6,169.06	.....	1,013.33	943.22	67,675.47
Light, Power and Fuel .....	9,257.59	.....	.....	414.12	309.83	.....	1,119.80	1,629.88	12,731.22
Insurance .....	508.80	1,530.17	103.71	6,638.96	2,074.58	52.43	117.95	1,080.73	12,107.33
Postage, Telephone and Telegraph .....	9,869.14	2,806.55	210.86	11,071.01	14,848.63	2,021.00	345.60	5,244.60	46,417.39
Rental of Equipment, Offices, Auto Storage, etc. .....	296.36	20,062.04	65.10	76,004.79	6,530.92	64.68	37.00	3,999.18	107,060.07
Bounty Payments and Grants .....	.....	.....	6,000.00	.....	.....	226,010.00	.....	2,448.75	234,458.75
Refund of Receipts .....	19.80	.....	.....	.....	311.85	.....	.....	.....	331.65
Fees:—Artists, Attorneys, Medical, Taxidermy, etc. .....	.....	2.50	2.00	655.00	203.58	.....	404.50	11,114.83	12,382.41
Bear Damage Claims .....	.....	.....	.....	1,532.63	.....	.....	.....	.....	1,532.63
Other Maintenance Services and Expenses .....	1,549.41	45.18	10.04	595.75	1,885.29	48.94	253.61	3,865.38	8,253.60
Newspaper Advertising .....	.....	.....	.....	689.20	9,537.95	478.95	269.50	111,462.72	10,227.15
Printing, Binding and Paper .....	5,054.94	279.82	4,992.38	4,426.18	2,539.53	.....	.....	.....	129,504.02
Printing, Hunters' Licenses, Tags and Misc. Forms* (through Department of Revenue) .....	87,063.08	.....	.....	.....	.....	.....	.....	.....	87,063.08
Contributions to State Employees' Retirement System* (through Department of State) .....	5,773.48	9,600.10	2,014.01	14,836.50	28,598.86	939.87	939.87	4,430.81	67,133.50
TOTAL EXPENDITURES .....	\$217,159.31	\$1,116,321.98	\$54,160.27	\$1,475,509.19	\$827,207.60	\$247,792.11	\$32,347.67	\$278,118.88	\$4,248,617.01

Cash Balance in State Treasury to credit of "Game Fund" May 31, 1952 .....

\* These items are paid out of the Game Fund upon requisitions drawn by the Department of Revenue and the Department of State and are included to complete the picture of the Game Fund finances.

\$1,389,569.34

### EARMARKED FUND

Under the provisions of the Game Law, as amended by the 1949 General Assembly, not less than \$1.25 from each Resident Hunter's License fee shall be used for improving and maintaining natural wildlife habitat on land that is available for public hunting; the purchase, maintenance, operation, rental and storage of equipment used in this work; the purchase, distribution, planting, cultivating and harvesting of game foods; the purchase, trapping and distribution of all species of game, as well as providing protection to the property of Farm-Game Cooperators.

This program has been in operation for three (3) years. The table below shows the expenditures in relationship to the minimum amount required by law for the fiscal years ending May 31, 1950, May 31, 1951 and May 31, 1952:

Year Ending	Expenditures	Minimum Amount Required
May 31, 1950 ....	\$1,211,687.72	\$1,012,917.50
May 31, 1951 ....	1,266,856.18	1,000,696.25
May 31, 1952 ....	1,095,938.26	1,012,528.75
Totals ....	\$3,574,482.16	\$3,026,142.50

During the three-year period, the Commission spent \$548,339.66 in excess of the minimum amount required by law for these operations.

### CAPITAL INVESTMENTS

The entire Game Fund is not available for normal operating expenses, such as salaries, traveling expenses, wages, feed for game, payment of bounties, etc., but a certain amount must be spent for the essential working tools of the Commission, also maintenance expense incidental thereto. To produce a shootable supply of game and provide natural habitat with adequate food and cover requires land, game farms, buildings, pick-up trucks, heavy motorized equipment, etc. Money spent for such items is commonly referred to as "Capital" expenses. Just as it is impossible for large industrial plants to operate successfully without making "Capital" expenditures so it is with the Game Commission. The table below gives the actual consideration paid for land, to-

gether with the estimated value of other items as of May 31, 1952:

State Game Lands (1920-1952) ..	\$4,268,197.6
Building on State Game Lands ..	131,945.0
Game Propagating Farms (including land, buildings and equipment) ..	523,715.0
Conservation School (including buildings, and equipment) ..	35,117.1
Equipment (including automobiles, trucks, tractors, graders, etc.) ..	232,682.6

Total ..... \$5,191,657.4

\* Consideration paid for lands including tit and survey costs.

† Estimated value as of May 31, 1952.

### HUNTING LICENSES ISSUED

To give you information on the general trend of hunting license sales since the license law was enacted in 1913, license sales at 5-year intervals from 1913 to 1938, and yearly from 1939 to 1951 are given below:

Year	Resident	Non-Resident	Total Licenses
1913 .....	305,028	No Record	305,0
1918 .....	311,290	478	311,7
1923 .....	497,216	2,328	499,5
1928 .....	437,727	1,190	438,9
1933 .....	524,337	4,966	529,3
1938 .....	654,146	7,584	661,7
1939 .....	653,852	9,049	662,9
1940 .....	666,420	12,748	679,1
1941 .....	675,434	10,922	686,3
1942 .....	640,821	8,394	649,2
1943 .....	570,901	11,833	582,7
1944 .....	593,917*	13,983	607,9
1945 .....	696,394*	17,227	713,6
1946 .....	832,846*	23,174	856,0
1947 .....	822,423*	28,012	850,4
1948 .....	854,840*	28,085	882,9
1949 .....	815,915*	24,032	839,9
1950 .....	808,171*	26,001	834,1
1951† .....	810,023	30,014	840,0

\* Includes free licenses issued to Members of the Armed Forces and Disabled Veterans as follows:

Year	Member of the Armed Forces	Disabled Veterans	Total
1944 .....	264	....	264
1945 .....	32,373	....	32,373
1946 .....	7,418	....	7,418
1947 .....	2,846	....	2,846
1948 .....	3,770	....	3,770
1949 .....	5,581	275‡	5,856
1950 .....	5,898	325‡	6,223
1951 .....	(Information not available from Issuing Agents at date of publication)		

† Issuance of free licenses to Disabled Veterans authorized by the 1949 General Assembly.

‡ Preliminary report, subject to minor changes.





Above photo shows a few of the  
old dogs entered in the Third  
Futurity Stakes.

lower photo appear a few crack  
entrants in the Derby Win-  
kers.

## Report On Events In The Beagle World

Photos by J. David Allen

By Stephen J. Allison

OWNERS and trainers of the little beagle hounds really do things in a big way, as verified by these photos snapped at a beagle event held last spring.

With a full program of 445 starters in five days, the Eastern Federation's 15th Annual Spring Derby Winners Stake and Second Annual Futurity

was held on the grounds of the York and Adams County Beagle Club, near York, Pa., starting Wednesday, April 23 and finishing Sunday, April 27, 1952. A large gallery, including practically everyone from the Eastern Beagling section, followed throughout the three days that the four Futurity stakes ran. Then one of the



largest groups ever assembled at a Beagle trial enjoyed two days during the running of the Derbies—Saturday and Sunday.

Both thirteen-inch Futurity stakes started on Wednesday morning with Harry Truxel, Mt. Pleasant, Pa., and Pat Rush, Phillipsburg, N. J. judging the 106 little bitches and Joseph Orlowsky, Pottsville, Pa., and Joseph East, Baltimore, Md., judging the 70 little dogs. These classes were marshalled by Charles Bupp and Paul Walker, both of York, Pa. Thursday afternoon 57 fifteen-inch dogs were started under judges Joseph Orlowsky and Joseph East, with 25 fifteen-inch bitches starting on Friday morning under Harry Truxel and Pat Rush.

The Derby Winners Stakes were drawn Saturday morning and run simultaneously through Sunday,

finishing late in the afternoon. In order to become eligible to run in the Winners Stake, a hound had to place first, second or third at one of the 49 member clubs qualifying Spring Derby trials. These Spring trials are held annually for beagles whelped the year previous.

The Futurity stakes are for two-year-olds. These puppies are litter nominated when they are born and become eligible through a process of three continuations over a period of two years.

The officers of the Eastern Federation of Beagle Clubs are: Thomas Holden, Paterson, N. J., President, A. E. Curren, Cedar Grove, N. J., Vice-President, Northern District, Joseph Gallagher, Baltimore, Md., Vice-president, Southern District Stephen Allison, Tamaqua, Pa., Secretary-treasurer.

*Winners in the Fifteen-inch Futurity for bitches. These top-flight beagles placed in the order of their appearance, from left to right.*



# Outdoor Reveries

## *Outdoors Murder, Inc.,*

By John H. Day

EVEN though it was Sunday morning, a peaceful, quiet mid-August Sunday morning, there was no letup in the grisly operations of Outdoors Murder, Inc. Everywhere I turned while prospecting the weed tangles behind the house, and the creek and pond edgings in the valley, some member of this bloodthirsty combine was stalking his prey. When the sun shines brightly and business booms in the thickets, these tiny footpads prowl ceaselessly, dispensing murder and mayhem whether it be Sunday or not.

In the fence corner below the garden a big orange garden spider had swung her orb web in a cluster of dogbane plants. A small grasshopper had made an unlucky leap into this snare, and I watched while Miranda deftly swathed her victim in deep-freeze silk for future dietary reference. The ground below was littered with bits of wings and other debris, mute evidence of the voracious appetite of this beautiful eight-legged animal.

I was surprised to find two Japanese beetles feasting on the leaves of smartweed. They must have tired of



my grape vines, and the big hibiscus blooms in the lawn. Close by a harvestman lurked in a broad leaf. This daddy-long-legs feeds mostly on dead insects, but he would not be averse to lethal dealings with any small fry which might happen along.

A tremendous jungle of tall ragweed and the big wild golden glow has taken over the flats behind the house. I crashed through this to the creek side, stirring up great clouds of the greenish pollen dust which makes life miserable for allergic hay fever victims. Honey bees were finding rich harvest in the scant blossoms of the yellow iron weed. As I watched a tiny wild bee leave these flowers and head for the woods beyond the creek, a phoebe came out of nowhere and deftly murdered this little worker.

I found a shady spot beneath an overhang on the creek bank and

loafed long enough for the bull frog who rents this area to get over his fright and crawl out on the bank at my feet. A vireo flew into the box elder overhead, killed a caterpillar, and then nearly flew into my face on his way elsewhere. The bull frog must have had an unhappy life, for he looked out on the world with a thoroughly jaundiced eye.

Farther down the stream I turned back into the fields, crossed a wire fence and came into a desolate area of worthless shale left behind by a coal stripping operation. Here there are several land-locked ponds, some of considerable depth, and all of considerable interest to all the dragon flies and damsel flies in the neighborhood. I found a congenial sloping bank in the full sun, and settled back to watch Outdoor Murder, Inc. stage its usual pondside performance.

There were whirligig beetles by the hundreds on the water, skidding about in a huge flotilla. Every unit in the fleet was alert to pounce instantly and unmercifully on whatever hapless bit of minute life should show its head either on the surface or beneath it. These miniature powerboats can swim, dive or fly with equal facility.

The empty larval skins of dragon flies were clinging to cattail stalks and other points of embarkation some four or five inches above the water. There were seven of these cast-off suits in a small clump at my feet, and two of the late occupants still on hand, pending the proper time to venture aloft. These were the big fellows known as "green darners" and I watched their beautiful transparent wings open and suddenly start to quiver. Then came the time to gun the motors and the pond dragons were air borne on their maiden flights.

Fragile damsel flies hunted close above the water, destroying midges and mosquitoes. The bigger dragon flies patrolled the higher air lanes,

making what seemed like regular rounds from this cattail to that weedstalk to that post and back again. Many a fly or mosquito or other bug was taken for a last ride in the basket embrace of their clutching legs and often devoured while on the wing.

The dragon fly is the countryman's true friend. His business is murder from the day he is born in the watery depths, but his main dish is mosquitoes, both wrigglers and adults, and that's all right with me.

While I was indolently watching the tiny pond folk my eye was attracted by some movement in the thickety edging of the bushy embankment which marks the limit of the stripping operations. I was amazed to focus on a big red dog fox nonchalantly poaching along, apparently indifferent to the busy traffic on the concrete roadway not fifty feet above him.

What breeze was moving was in my favor, and the light was full on the red fellow, so that I could see quite plainly his white throat and the black tipping on his ears. Clearly he had learned that boldness and audacity pay off, for I know of at least six farm dogs in the neighborhood who would have died of chagrin had they been aware he was light-footing it across their preserves. And in broad daylight of a Sunday morning, to boot.

He wore no lean and hungry look, but appeared fat and in fine fettle, and primed to do justice to a snack of juicy meadow mouse. I picked him up in the field glasses and watched with delight as he made the rounds, checking every promising copse, and stopping now and then, one forepaw high, to read the latest news on the sluggish air.

He skirted the edge of one of the distant ponds, made a try for something—probably a frog—and missed, and then turned back toward the thicket. He had to make a wide de-

tour to avoid crossing a narrow inlet, for he would much rather travel round about than get his feet wet.

Then I found out that someone else had also seen the fox. The groundhog who has occupied a den in that bank for several seasons suddenly whistled and scuttled below decks. The fox instantly headed for the burrow, but ran into nearer game which took his mind off the whistlepig.



I could not at first imagine what he was chasing and stomping with both forepaws. Then suddenly he flipped a big garter snake into the air and pounced on it for the kill. He ate a portion of the snake, then started on down the edge of the bank in the direction of the neighboring town.

I shifted slightly to a more comfortable position, and jarred my walking stick, which fell noisily across some shaly rock. The roar of the passing cars above had not disturbed Reddy in the least, but he heard that cane fall, even though he was some

seventy-five yards distant and going away. How he did it, I don't know, but he seemed to vanish into thin air instantly. One moment I had him full in the glasses—then he was gone, and I had the odd feeling that perhaps I had imagined the whole episode.

I roused myself enough to mosey over to the spot where he had met up with the snake. There were the gory remains, already of much interest to some blue-bottle flies, mute evidence that the garter snake had run afoul of another of the working members of Outdoors Murder, Inc.

I clambered up the embankment, risked life and limb in a successful crossing of the roadway, and rambled through the broad pastures of the neighboring farm in a circling route back to my own dooryard. Some of the neighborhood crows were congregated in a far fence corner, with an outpost in a wild cherry keeping a weather eye on me. I shifted course and bore down on the sable fellows, who abandoned the field without a fight.

They had been enjoying a Sunday dinner of fat rabbit, whose sorry remains, cotton tail and all, they had discovered in that fence corner. Condition of the kill indicated that the bunny had not died of natural causes, but had been murdered by a midnight marauder whose name is weasel.

Usually the weasel defers his rabbit hunting until the cold months, since the crop of mice and moles and small ground birds is plentiful under summer skies, but his insatiable lust for blood had cost this luckless rabbit his life, if the cottontail had not already died from fright before the relentless killer closed in. Here was a case of pure murder for the mere joy of killing, with the crows reaping the doubtful benefit.

I was nearing the final fence line edging my own preserves when yet another murderous assault took place

before my eyes. The swifts who make one of our unused chimneys their home base were coursing high overhead, hunting out what provender the warm updrafts had lured aloft, and the pigeons who occupy the neighboring barns were out on a wide, circling, training flight.

As I watched the swifts I chanced to note a jet-propelled object hurtling down out of the blue, in open attack on the unsuspecting pigeons. There was a sudden slashing sidewise "stoop" and one of the pigeons was choked to death even as it fell to earth in the clutches of the audacious duck hawk who had happened along overhead in his lone wanderings.

There was a short scuffle on the ground as the feathers were torn

from the warm breast of the hapless victim and the falcon began his bloody orgy. I could not help but admire the falcon's magnificent dive and his adroit murder of the clumsy pigeon, even while I shuddered to think of the many game birds and feathered songsters who had succumbed to his unerring marksmanship.

The noon hour was almost at hand when the duck hawk made that tremendous drop on the pigeon. I moved indoors, away from the lethal atmosphere of Outdoors Murder, Inc., to enjoy a trencherman's lunch and relax in the comparatively tame entertainment of the mystery thrillers of the air waves.

. . . *The End.*



PGC Photo by Cady.

*Of the six applicants who submitted to the Taxidermy Examination on July 10, all passed successfully. Above, a participant explains his methods of workmanship to the Examining Board, consisting of Harold T. Green, Academy of Natural Sciences, Philadelphia; M. J. Kelly, Everhart Museum, Scranton; and James Kosinski, Carnegie Museum Pittsburgh.*



# *Outdoor Kids*

By Hal H. Harrison



**B**ILLY and Jane have learned to attract wild birds around their home because they have learned to provide birds with the three things that they need at all times . . . food, shelter and water.

They have learned that none of these essentials should be overlooked. Many persons who have winter feeding stations, food bearing shrubs, bird-houses and dense vines and trees on their grounds, sometimes forget about water for their birds.

Of course folks who live near lakes or streams or other natural waterways do not have this problem. People who live in the city, like Billy and Jane do, must put out water where the birds will find it.

In their garden, Billy and Jane have a pottery bird bath which their parents purchased at a department store. In hot weather this bath becomes dry in just a few days, and they have to watch that it is filled regularly. It is at this season that the birds need the water most.

Many people build a bird bath themselves. A good one can be made from the lid of a trash can turned upside down and placed on top of a post, where visiting birds will be safe from cats and squirrels. A rock placed in the center provides a good landing place.

Last winter, Billy's and Jane's father brought a pottery pelican home from Florida. He thought it would make a more attractive landing place in the middle of the bird bath than the old rock that had always been used. It took the birds almost a week before they would trust the strange looking bird that stood motionless in the middle of their bird bath. Birds are usually afraid of anything new and that pelican certainly was new in a Pennsylvania garden.

Where it is possible to provide running water in bird baths, more birds will be attracted, for the movement and sound of running water will bring birds to drink and bathe that would not visit a quiet little pool.

Two things to remember when placing a bird bath are that it should be in partial shade and that there should be protective cover nearby. Water heated by the hot sun is not visited on warm afternoons when it is needed most. Birds like the protection of nearby shrubs and trees, from which they can fly to and from the bath without exposing themselves too much.

Furnishing water for birds in winter is more of a problem. Snow very often gives the birds all the drinking water they need. If bath water is to be provided in Pennsylvania, it must be changed several times a day to prevent freezing, or it must be heated. A lighted electric-light bulb placed under a tin receptacle provides an easy way of keeping water from freezing.

. . . *The End.*

## THE LIFE OF A GAME COMMISSIONER

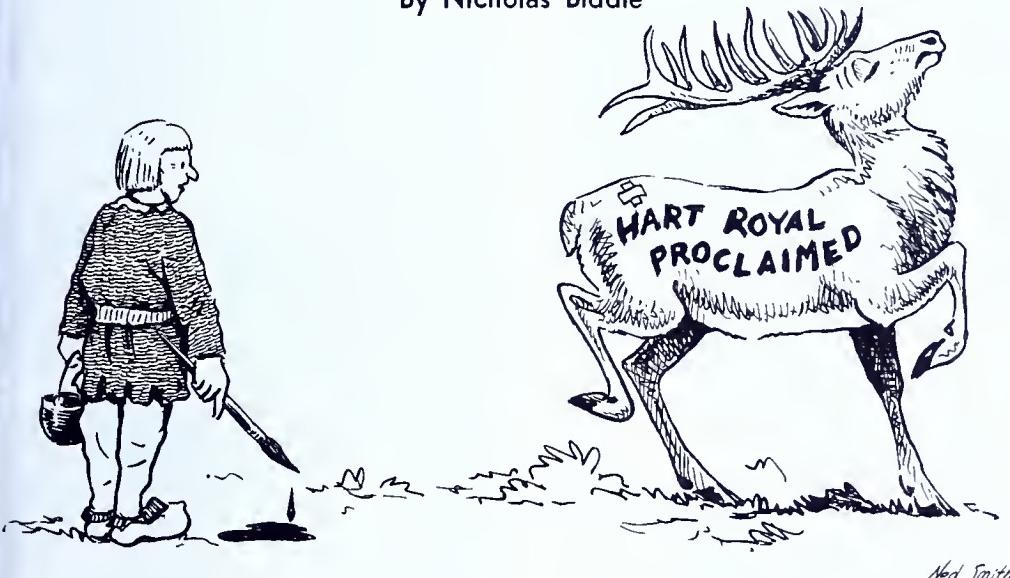
What have I done, I ask  
That I deserve such fate?  
I'm just a common fellow,  
But now let me relate  
The trials and tribulations,  
The cares and worldly woes,  
The unkind salutations,  
That my Commission knows.  
"Say there," says one, "go kill those birds,  
They're eatin' up my corn."  
Another voice, "We want more birds."  
Why was I ever born?  
And if the fish ain't bitin',  
It's because there's none to bite.  
Yet I know there's plenty of 'em,  
I can't give 'em appetite.  
And if the trees are buggy,  
And the weather isn't good,  
It's because the Game Commission  
Isn't doin' all it could.  
Says another brainy fellow,  
"Better set the season soon."  
Jumps 'up another yippin',  
"Set it late, or it's your doom."  
You'll catch it if you do it,

And you'll regret if you don't,  
You're a "bloomin' politician,"  
If you will or if you won't.  
Even for all acts of nature,  
The Commission is to blame.  
I don't know why I do it,  
But I love it just the same.  
But we all keep workin' anyway,  
For our birds and the fish.  
'Cause down at heart, we all have got  
A common eager wish.  
To see our state a garden spot  
Of beauty, fish and game,  
So tho' my job's a crazy quilt,  
I love it just the same.  
Our hopes and dreams, they're all the same,  
No matter what your name.  
'Cause we all are aimin' upward,  
Our target is the same.  
So get on board my fellow man,  
In fact, let's all go fishin',  
But please, dear sir, if they don't bite,  
Don't blame the Game Commission.

*By Paul T. Gilbert  
in Outdoor Nebraska*

# *History of the Game Laws of England*

By Nicholas Biddle



Ned Smith

## PART II

THE species of deer were the Red Deer, referred to under Hart and Hind, which were the largest; the Fallow Deer, so-called from its pallor, or pale yellow color in Summer, both sexes being spotted with white and the males antlers being palmated near the ends; and the Roe Deer which was reddish brown in Summer and grayish in Winter with a white rump.

The Buck, or the Roe Deer, had erect cylindrical antlers forked at the summit; they disappeared from England at an early date but are found today in Scotland.

The wild animals of the Chase were the Buck, Doe, Fox, Marten and Roe Deer, which frequented the fields, hills and mountains in the daytime and the valleys, cornfields and meadows at night.

Red Deer were classified as follows:  
 1st year—Hind Calf or Calf  
 2nd year—a Brocket  
 3rd year—a Spayad  
 4th year—a Staggard  
 5th year—a Stag  
 6th year—a Hart

If a Hart was hunted by the King and escaped alive he was called a Hart Royal and if, in hunting, he was driven so far out of the Forest that he was not likely to return at that time and the King gave up hunting him, then, because he had provided such sport, the King would have a proclamation made in all the nearby towns and villages that no person should kill, hurt, or hunt him and appointed certain Foresters to look after him until he returned to the Forest; he was then called a Hart Royal Proclaimed. The open season

for the Hart began in mid-summer and continued until Holy Rood Day, or September 14th.

The Hind was the female of the Hart and was called—

1st year—a Calf

2nd year—a Brocket's Sister

3rd year—a Hind

The open season began at Holy Rood Day and continued until Candlemas Day (Candlemas Day in the Church Calendar is the Feast of the Purification of the Virgin Mary or Presentation of Christ in the Temple, which is celebrated on February 2nd, so called because the candles of the Altar, or for other sacred purposes, are blessed on that day. In the United States this day coincides with Groundhog Day).

The Boar was called—

1st year—a Pig of the Sounder

2nd year—a Hog

3rd year—a Hog's Steer

4th year—a Boar

Afterwards—a Sanglier

The open season was from Christmas until Candlemas Day.

A Hare was a beast of the Forest and also of the Warren and by the old Foresters was known as the King of Game Beasts—it was called

1st year—a Severet

2nd year—a Hare

3rd year—a Great Hare

The common Hare was brown and about the size of one of our Western jackrabbits and could run like a race horse. The season for hunting began at Michaelmas (in honor of St Michael), celebrated September 29 and ended about the last of February.

The Buck was the first beast of the Chase and was called—

1st year—a Fawn

2nd year—a Pricket

3rd year—a Sorel

4th year—a Sore

5th year—a Buck of the Head

6th year—a Buck

The season began at mid-summer and ended at Holy Rood Day.

The Doe was the second beast of the Chase and was called—

1st year—a Fawn

2nd year—a Pricket's Sister

3rd year—a Doe

And After

The season began on Hcly Rood Day and ended at Christmas (you will note the Doe season began when the Buck season ended, which was similar to our Antlerless Deer Season in 1951)

The Fox was the third beast of the Chase and was called—

1st year—a Cub

2nd year—a Fox

And After

The season of hunting began at Christmas and lasted until Lady Day being the Feast of the Annunciation or March 25th (until 1752 the beginning of the Civil year in the English Calendar).

Although the Common Law permitted the hunting of beasts of prey such as the Fox and Badger in other peoples' grounds, it was illegal to dig the ground to unearth them. You will note that the Fox and the Badger are classified together.

There was a case on record of a man being prosecuted for trespass who unkenneled a Fox on his own lands and his hounds pursued the Fox onto the grounds of the Plaintiff doing some damage to his hedges. The Defendant was adjudged not guilty because the damage was done involuntarily and that he might lawfully pursue the fox because it was a noisome creature to the public.

A Park was a large piece of enclosed ground; the owner having obtained a license from the King, where wild animals were protected from the public and preserved for hunting by the owner.

The King could also grant a franchise for a person to have a Warren for the preservation of certain game animals, such as Hares and Conies and such game birds as Partridge, Pheasant, Quail, Woodcock or vari-

ous types of water fowl. This was somewhat like our propagation areas in Pennsylvania today.

Anyone who unlawfully entered a Warren or killed game therein against the will of the owner, or occupier, was subject to fine and imprisonment, or both.

There was heavy damage and costs and as much as three months imprisonment for trespassing, chasing, catching and killing conies against the owner's will on the ground used or the breeding of Conies, even though the ground was not enclosed. There was also a fine of 10 pence for killing a Coney running on a public highway near a Warren. (Imagine what the income to the Game Commission would be today if fines were collected for all the Rabbits killed on the public highway.)

The game birds which were hunted were—Bittern, Bustard, Crane, Duck, Grouse, Heathcock, Heron, Partridge, Quail, Rail, Swan and Woodcock. There is no mention of geese although several varieties of wild geese visit Scotland. It is interesting to note that the Bittern and Crane were classified as game birds. In America we have the wild turkey in place of the Bustard.

The law of the Forest recognized the necessity of using dogs for the safety of man's possessions and houses who lived within the boundaries of the Forests so that certain dogs were permitted to be kept there by any person whatsoever.

The Mastiffs, which were expeditated (to deprive them of three of the claws, or of the ball of each of the forefeet in order that they would not chase deer) and small dogs were allowed to be kept in the Forest without a special license; on the other hand it was unlawful to keep greyhounds from the time the Forest Laws were enacted, only a grant from the King could unexpeditated mastiffs and greyhounds be kept within the boundaries of the Forest.

It was unlawful for anyone to hawk or hunt with spaniels in standing grain or before it was shocked unless it was on their own ground, or with the owner's consent. The fine for this misdemeanor was 40 shillings, payable to the owner of the ground.

If any person, not qualified, kept on using greyhounds, lurchers, setting dogs, or tumblers or any weapons to destroy game and was convicted by a Justice of the Peace, where the offense was committed, he was fined 5 pounds; one-half of which went to the informer and the other one-half to the poor of the Parish. If the fine was not paid, the offenders were sent to the House of Correction for three months for the first offense and four months for every other offense.

A Lurcher was a mongrel dog, especially a cross between the collie



NS.

and the greyhound and was often used by poachers.

The setting dogs were English, Irish or Gordon Setters which originally crouched on pointing game.

The Tumbler was an early breed of dog used in coursing rabbits.

The early weapons used for hunting were Bows, Cross-bows and Hand-guns, Hagbuts and Demi-hakes. People could only own these weapons if they had land or some other inheritance in their own or their wives' right, worth 100 pounds per annum or for life, or under lease for 99 years and worth 150 pounds per annum.

Exceptions to this law were the son or heir of an Esquire or other person of higher degree and owners and keepers of Forests, Parks and Chases; or Warrens stocked with deer or conies for use in the above.

The fine for breaking this law was 10 pounds for every offense. The same penalty was exacted if the Hand-gun was less than a yard long and Hagbuts and Demi-hakes less than three quarters of a yard in length.

A Hagbut, or Hackbut, was a Harquebus of which the butt was bent down or hooked for the convenience of taking aim. This coincides with the drop of the butt of guns today.

A Demi-hake or Demi-hague was a small variety of Hagbut.

The Harquebus was a portable firearm invented about the middle of the 15th Century, having a match lock operated by a trigger or, later, a wheel lock or perhaps a flint. They were at first so heavy as to be fired from a support. The Harquebus was superseded by the musket toward the close of the 16th Century.

A man having lands worth 100 pounds per annum had the right to seize guns, bows and crossbows used contrary to the law but he had to destroy them within twenty (20) days or pay a fine of 40 shillings.

It was unlawful to travel with a cross-bow bent or a gun charged,

except in time of war, or to shoot within a quarter of a mile of a City Borough of Market Town, except in defense of himself or his home or at a target. The fine for this offense was 10 shillings.

Also, no one could allow his servant to shoot a gun or coss-bow except as above without being subject to the same penalty, the penalties to be divided between the King and the Prosecutor.

However, the followers of Lords Spiritual and Temporal Knights, Esquires and Gentlemen and those that dwelt a quarter of a mile from a Town were allowed to keep guns of the proper length in their houses to shoot at a target only.

Persons empowered by the King to use guns, bows or cross-bows in the Forests for hunting could retain the same, also gunsmiths and merchants who sold guns could keep them in their houses provided they were the proper length.

A servant, by command, could use his Master's bow, cross-bow or gun but was not allowed to shoot any game birds or animals with it and any sheep owner could keep a gun but only use it on the sheep.

If any person not having lands worth 40 pounds per annum, or owned less than 200 pounds in goods, or some enclosed ground used for deer or conies worth at least 40 pounds per annum, kept a gun, bow or cross-bow for hunting purposes, it was lawful for any person having lands worth 100 pounds per annum to take such weapons from any such person and convert the same to his own use.

Hawking, which was termed a noble recreation, was another sport which was popular in the early days of Britain. This also was subject to the game laws. Only those with an Estate could keep a trained or reclaimed hawk and a permit from the King was required to keep any hawk of English breed; called Eyess, Gos-

hawk, Tassel, Launer, Lanneret or Falcon.

A special permit was required to bring an Eyess from Scotland or Europe.

If anyone killed or frightened away any of the above hawks from the coverts where they were accustomed to feed, they were fined 10 pounds before a Justice of the Peace, the fine being divided between the King and the Prosecutor.

When a trained hawk, which had not returned to its owner, was found it had to be delivered to the Sheriff who, after proclamation, made in the towns of the Country and the hawk was claimed delivered to the right owner.

If the hawk was taken up by a man without an Estate and was not claimed within four months of the Sheriff's Proclamation, the Sheriff retained the hawk, paying the person who had taken it up, but, if the hawk was taken by a man with an Estate who might keep a hawk, the Sheriff restored it to him if he wished to keep it.

Many of our Game and Fish Laws in the United States and Canada are modeled after the old English Laws, just as the foundation of our legal procedure is based on the Magna Charta.

We differ, however, in North America in regard to the privilege and opportunity the general public is given to hunt and fish without being the owner or lessee of large tracts of land or inland streams.

This, of course, was made possible in the early days by the immense amount of virgin land claimed by the various foreign governments or purchased from the Indian and the comparatively few people who settled on it. At first no game and fish laws were necessary as, in the early days of Britain, but as the population and hunting and fishing pressure increased and more and more land became privately owned or controlled

and converted into residential, business, or factory areas, it became necessary to institute game and fish laws to prevent wildlife from being exterminated. It eventually became necessary for the Federal Government to maintain large refuge areas for wild life such as Yellowstone Park, Everglades National Park and Okefenokee Wildlife Refuge.

The Federal Government and the States also acquired large areas, part of which were open to public hunting and part maintained as game refuges. This was done in Pennsylvania through the foresight of that great conservationist and former Game Commissioner, John M. Phillips.

The next step was State propagation areas which were set up solely for this purpose and finally Farmer-Sportsmen areas which, in Pennsylvania, are known as Farm Game Co-operative Areas.

Due to the disrespect, carelessness and lawlessness of many hunters and fishermen and the increase in their numbers, particularly in the vicinity of large centers of population most of the privately owned land in these areas is posted against trespassing so that it is impossible to hunt or fish in such areas without the invitation of the land owner or lessee.

There are still, however, many thousands of acres of Federal, State and privately owned land in Pennsylvania and other States and many miles of public lakes, rivers and streams where people can hunt and fish as well as commercially operate shooting grounds.

It is the duty of everyone to familiarize himself with these places before starting out to hunt or fish unless they plan to go on property owned or leased by themselves or where they are invited guests or on the Regulated Shooting Grounds which are commercially operated and open to public use.

. . . *The End*



By Ed Shearer

# Buying A New Shotgun

RECENTLY while visiting a modern sporting goods store my attention was attracted to two young chaps who were negotiating the purchase of their first shotgun. That this was serious business was attested to by the careful examination of each gun and the searching questions asked of the relative deadliness of the different makes and models.

It carried me a long way down the back trail to another era and another day when I, as a young fellow, bought my first scattergun at the town sporting goods store. Stores, like guns, have changed a lot since then. The older shooters will always regret the passing of the old time sporting goods store with its pungent odors of gun oil and good leather. The inevitable pot-bellied stove was surrounded with an assortment of mismatched chairs, and around this "council fire" the achievements of certain individual hunters, the merits of this dog or that, and the potency of various powders and guns were gravely weighed and deliberated upon.

The gun rack was filled with examples of the gunmaker's art and craftsmanship seldom seen today, and within reach of the ordinary man's pocketbook were our Parkers, Ithacas, Smiths and A. H. Foxes, with a few imported Greeners, Sauers and Dalys thrown in for good measure. A Parker Trojan looked and felt like a gun, with barrels and boring to suit, and could be bought for twenty-five smackers. For sixty-six ducats you could have the DH Grade built to order with a Circassian Walnut stock thrown in for good measure.

Today's hunter buying his first gun has quite a different setup. There is no use kidding ourselves. Between high prices, high taxes and the family budget the scattergun field is somewhat limited, unless you own an oil well.

There are lots of factors to consider when selecting a shotgun. What conditions are you going to use it under most of the time? How much walking are you going to do? Is your hunting in thick cover or open country? The old rule of long walk, light gun and thick cover, short barrels is still a pretty good one.

What type gun do you prefer? Single, double, repeater or automatic? Get the type you like and don't let anyone talk you out of it. You're going to shoot it, carry it and pay for it. The last item to consider is the state of your pocket book. That's a private matter between you and the income tax collector and you will have to decide that. Now let's take a look at what's offered.

In the single barreled guns you can go anywhere from \$20 to \$2,000. Yessir, that's the price tag on Ithaca's top grade trap gun. I am fresh out of them so can't tell you much about it. But in the \$20 to \$30 price range there are several reliable single barrel guns put out by Winchester, Iver Johnson, Harring & Richardson, Stevens, and a bolt action repeater by Mossberg.

Now there has been a whale of a lot of game killed with the single shot. It does away with the foolishness of filling the atmosphere full of lead and hoping something will run

into it. But there are occasions when the single shot gives you some poignant moments. Take the time you sneaked into the duck pond in the cold gray dawn and you missed a mallard drake as he rocketed into the air at 40 yards. Then three more that you never saw went out from under the bank you were standing on while you vainly tried to claw a shell out of your pocket and into the gun in time to do some good! Yep, I've been there.

### WANTED!

Writeups on outstanding projects undertaken by your sportsmen's club. Too many of our clubs are in a rut. If your organization has done something *big*, something *new*, something *different*, in the way of promoting conservation or good sportsmanship we'd like to pass it along to other clubs who are dying a natural death. Our CLUB NOTES column depends entirely upon *you* for its material.

Now the bolt action repeating shotgun at only a couple of extra bucks is not a marvel of speed or an object of beauty. But it's several hops, skips, and a few jumps ahead of frantically trying to fish a shell out of your pocket and pop it into the breech of your gun, and is strong and reliable.

When we look into the field of side by side doubles we find that the fine old doubles are slowly being crowded out of the picture. The high cost and scarcity of fine craftsmen and the speed of fire demanded by the new crop of shooters are the main reasons. Parker has gone off the market. Ithaca is out of production and the Fox is represented by a run-of-the-mill double called the model B, with the take home price of \$77. Stevens has a couple of

models ranging from \$50 to \$60. Winchester has a model M-24 in the \$70 bracket. You don't get much in the way of finish, stock measurements or extras on these guns. But they are strong, well made, reliable, good shooting guns that will give good service and stand a lot of grief. You can use heavy loads in them until the cows come home and they won't shoot loose or blow up. Any boring may be had on these guns.

L. C. Smith is still putting out fine doubles and allows plenty of choice in the way of extras. Single triggers, selective ejectors, barrel length, stocks to order or what have you. Prices on the Smith line start at \$100.

Winchester puts out a beautiful model 21 with single selective trigger and selective ejectors that has the balance of a ballet dancer. You can get any thing you want in this model and it has the craftsmanship and superb feel of the finest of imported shotguns. Prices start at \$329 to as high as the Woolworth building.

In the over and under doubles the picture is better as this used to be a very high priced field. Marlin makes the model M-90 with optional barrel length and boring. Shotgun has two triggers and is well made, with the balance and feel of a high priced shotgun. It's a good buy at \$94.45 if you like 'em piled on top of each other.

The Moronne is a new comer and while I've never seen it the reports are good. This one can be had with extras and is tagged at \$148.50.

The Browning over and under is strictly a high class shotgun of the finest workmanship and materials. It can be had in weights of 6½ pounds up in 12 gauge with selective single trigger, selective ejectors etc. I've shot this model for the past twelve years and can state that it is a lifetime gun. Prices start at \$236.

The pump or slide action leads the field in popularity. There is no

doubt that the corn sheller is a great American achievement. Any shooter who learns to operate the gun on the recoil can shoot it as fast as the semi-automatic for all practical purposes. It can be readily adapted for any sort of shooting. You can get the large capacity magazine for general use and plug it for any number of shots for special conditions. You can use lead plugs and change the balance at will. Pump guns are ideal for muzzle devices that give you any desired degree of choke. Their construction is very strong and they take grief like a Missouri mule. In price range they run from around \$60 for the Stevens through the various models by Winchester, Savage, Remington and Ithaca to about top price of \$95 for the standard grades. Extras can be had on most. They have stood the test of time.

The auto-loader has about the same features as the slide action in regard to barrels and muzzle devices. All auto-loaders made in this country are based on the John M. Browning design. They are made by Savage, Browning and Remington. In this type the price range is from \$110 to \$120. Extras can be had. They are reliable when fed good ammunition but are not so good for a beginner.

Barrel length is a problem to most beginners, so here are some hints. There is no practical difference in the killing power of barrels between 26 and 32 inches, that is a matter of boring. Length should be chosen for the conditions. Tight boring goes with long barrels for long range; you need a long sight radius for judging lead, close holding and a smooth, steady swing.

Short barrels go with open boring where the ranges are short and fast gun handling is demanded. Also the length of barrels is somewhat related to weight. A gun with a light weight action and long barrels results in a muzzle heavy gun that is

too slow for fast work and too light for the heavy loads used in long range shooting. A length of 28 inches is a fair compromise where you are going to use the shotgun under all conditions.

In regards to gauge, the bigger the hole in the barrel, the more lead you can pour out of it. In standard loads the 12 gauge has about 25% more shot than the 20 gauge. You can use this two ways. You can have more shot within a given circle and get a greater killing range, or you can have a bigger killing pattern with the same shot density as the smaller gauges would give you. The guy who tells you the 20 will kill as far as the 12 gauge is simply doing a lot of wishful thinking.

Gun weight is a matter of how much carrying you are going to do and what type loads you are going to use. Hi speed loads in a feather-weight gun will kick you loose from your hat.

Boring is probably the most important point the beginner should consider. It should throw the largest possible pattern of satisfactory density at the average range he will take his game. He should back this up with the largest charge of shot he can comfortably shoot.

Here is a rough guide to boring. The  $1\frac{1}{4}$  ounce of shot in the 12 gauge is effective in the improved cylinder at from 25 to 30 yards. The modified choke from 35 to 40 yards. Over this a full choke is called for. The beginner will hit precious little game at 40 yards and his misses at short range will be appalling with a full choke barrel.

Now pick the gun that fits your conditions, preferences and the state of the family finances. Then hie yourself to the sporting goods store and if you don't spend twice what you can afford, you will do better than I ever have.

. . . The End.

# Schuylkill County

Twenty-fourth in a Series

*Note: If desired, this center sheet can be removed without damaging the magazine by loosening the two center staples.*

## Land Area

The county contains 501,888 acres, of which 344,006 are forested. Publicly-owned lands comprise 18,091 acres, of which 9,392 acres are found in State Game Lands.

## Topography

Much of Schuylkill County is mountainous, being traversed by six mountain ranges. Flourishing farms cover the intervening valleys.

The county is drained by Mahantango, Catawissa, Swatara and Wiconisco Creeks and the Schuylkill River.

## Transportation

Railroad transportation is furnished by the Reading, the Pennsylvania, the Lehigh Valley, the Central Railroad of New Jersey, and the Lehigh and New England Railroads.

U. S. Routes 122 and 209, and other important highways traverse the county, which has 633 miles of improved State highways.

## District Game Protector

John Spencer, 17 E. Union St., Schuylkill Haven, has jurisdiction over Upper Mahantango, Eldred, Hegins, Barry, Porter, Foster, Frailey, Tremont, Reilly, Branch, Pine Grove, Washington, Wayne and South Manheim townships.

Billy A. Drasher, R. D. 1, Tamaqua, has jurisdiction over North Union, East Union, Union, Butler, West Mahanoy, Mahanoy, Deland, Kline,

Rush, Rahn, Cass, New Castle, Ryan, Norwegian, East Norwegian, Slythe, Schuylkill, Walker, North Manheim, West Brunswick, East Brunswick and West Penn townships.

## Fish Warden

Anthony J. Lech, 420 Hess St., Schuylkill Haven.

## District Forester

H. A. Spangler, 214 North Centre St., Pottsville.

## Agriculture

Approximately one third of the county's area is devoted to farming, with potatoes, cherries, apples, strawberries, livestock and livestock products the principal agricultural products.

## Industry

By far the most important industry of Schuylkill county is the mining of anthracite. Mining products constitute approximately nine tenths of the county's total value of all products. Next to mining, the textile industry is second in importance. Principal products are anthracite, shirts, beer, explosives, clothing, bakery products, shoes, and meat packing produce.

## Historic

Schuylkill was formed from parts of Berks and old Northampton Counties in 1811, and Orwigsburg became the first county seat. In 1851 the county seat was moved to its present location in Pottsville. The name is of Dutch origin and means "hidden stream" because early explorers on the Delaware failed to notice the mouth of the Schuylkill creek.

From 1744 to 1778 the pioneer settlers were continually threatened

... KEY ...

- (Circle) .... County Seat.
- (Bird) .... Game-Game Project.  
(Open to Hunting)
- (Tower) .... State Forest Fire Observation Tower.
- (Man) .... Game Protector's  
Headquarters.
- (Hunting) .... Game Propogation Area.
- (Deer) .... Deer Hunting.
- (Turkey) .... Turkey Hunting.
- (Hunter) Small Game  
Hunting {Grouse,  
Pheasant,  
Rabbit &  
Squirrel.
- (Railroad) .... Railroad.
- (Wavy Line) .... Stream.

[Solid Black Box] .... State Game Land.

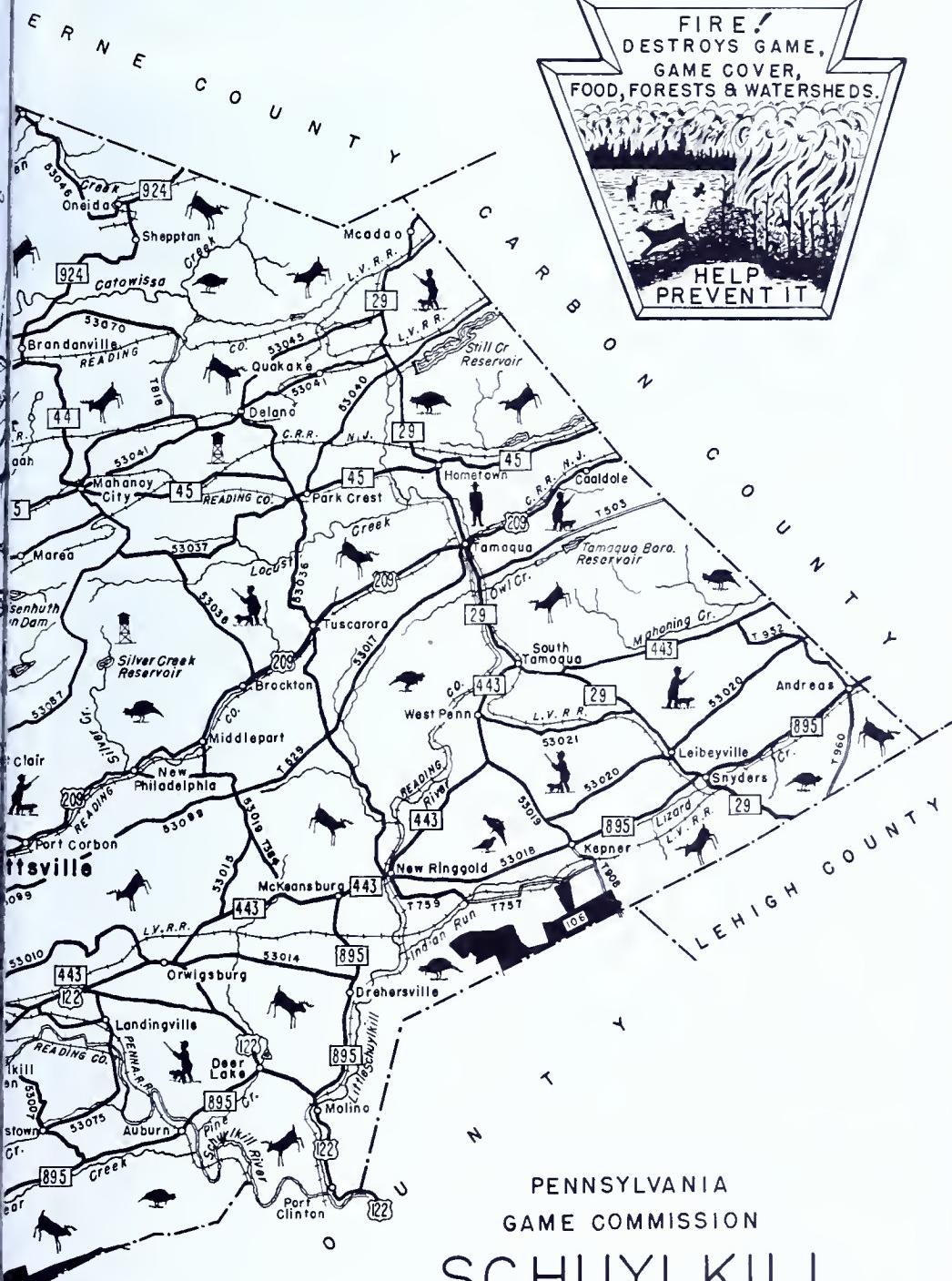
[Box with 45] .... Pennsylvania Route Number.

[Box with 209] .... U.S. Highway Route Number.

53024 .... Legislative Route Number.

— .... Township Route (T-594)





PENNSYLVANIA  
GAME COMMISSION

# SCHUYLKILL COUNTY

PENNSYLVANIA

1 0 1 2  
Scale in miles

by hostile Indians, and Colonial forts were constructed along Blue Mountain at intervals of fifteen or twenty miles.

The county contributed two companies of men in the Revolutionary War. One hundred men from the vicinity of Pine Grove fought with General Anthony Wayne at Brandywine and later in the battle of Germantown. A second company of volunteers was organized from this section.

When the Civil War broke out two of the five companies making up what were called the "First Defenders" came from Schuylkill County to join the colors. They were the Washington Artillery and the National Light Infantry, and were among the first troops to arrive in Washington and to serve in the defense of the capital city.

One of the first discoverers of the potential value of anthracite as fuel was a lumberman, Necho Allen, who in 1790 built a fire among some rocks while on a hunting trip and awoke from a subsequent nap to find the "rocks" ablaze.

In 1812 Colonel George Shoemaker, of Pottsville, hauled nine wagons of anthracite coal to Philadelphia to establish a market for the new fuel.

He succeeded in selling only two loads to cover transportation costs when he was called a swindler for trying to sell "black rocks" as fuel. He gave the remainder to people who promised to give the fuel a try, and this trip resulted in the use of anthracite in a Delaware County rolling mill.

In 1830 the Schuylkill Canal, from Pottsville to Reading, was opened, greatly facilitating the transportation of anthracite to city markets.

The same year Stephen Girard financed a railroad which was to join Pottsville and Danville. At his death

construction was temporarily halted but was subsequently resumed with the completion of six inclined planes to take the horse-drawn cars over Broad Mountain.

### Recreation—Hunting

Schuylkill County provides some very good deer and grouse hunting in the wooded areas, while the country furnishes good hunting in the agricultural sections. A few wild turkeys are found in the mountains.

State Game Lands in the county include the following: Number 13, Hegins, 1,247 acres; a part of Number 84, Pitman, 542.5 acres; a part of Number 80, Pine Grove, 3,770 acres; a part of Number 110, Port Clinton, 2,393 acres; a part of Number 10, Drehersville, 1,440 acres.

### Recreation—Fishing

Fishable waters (name of stream or lake, fish stocked, location and length or area of stock waters) include: Bear Creek, brook trout; Auburn, 7 mi.; Beaver Creek, brook trout, Tuscarora, 2 mi.; Little Catawissa Creek, brown & rainbow trout; Ringtown, 6 mi.; Deep Creek, brown & rainbow trout; Hegins, 7 mi.; Evergreen Branch, brown trout, Pine Grove, 2 mi.; Fishing Creek, brown trout, Pine Grove, 3 mi.; Fishing Creek, W. Br., brown trout, Pine Grove, 5 mi.; Lizard Creek, brown & rainbow trout; Andreas, 5 mi.; Locust Creek, brown trout, Barnesville, 5 mi.; Pine Creek trib. Mahantango Creek, brook trout; Valley View, 5 mi.; Pine Creek, trib. Schuylkill River, brook trout, Schuylkill Haven, 4 mi.; Little Pine Creek trib. Schuylkill River, brook trout, Barnesville, 3 mi.; Neifert Creek, brook trout, McAdoo, 2 mi.; Rattling Run, brook trout, Hamburg, 2 mi.; Little Swatara Creek, brown & rainbow trout, Freidensburg, 5 mi.; Sweet Arrow Lake, black bass, Pine Grove, 150 A.

. . . The End.

# The Unwanted Catch

By L. J. Kapp



## PART II

**R**EGARDLESS of the precautions taken you will sooner or later find an unwanted animal in your trap. Releasing him can be quite a job, depending upon the kind and disposition of the creature involved.

The dog problem is a tough one. In the event that a fox trapper finds a dog caught in a trap he might be expected to ask, "Should I risk bodily injury in an attempt to release it? Should I go for help, or should I shoot it? If I shoot it, will it ruin my set for future catches? Or even worse, should I risk the chance of being sued by its owner or killing a valuable hunting dog?"

Just which course you should take depends partly on the dog, and partly on your personal emotions and ability.

To begin with, a trapper should be equipped with several tools which might prove useful. One of these would be a .22 revolver or pistol. (A permit is required to carry such a weapon). Another highly useful tool is made thus: Secure a handle from an old broom, or a stick of similar size will do. This stick should be about three feet long. A length of ordinary washline rope, about four feet long is the second part of this tool. Two screweyes large enough so that the rope can be threaded through are also needed. One of these screweyes is then screwed into the tip of one end of your stick,

while the other is screwed into the side of the stick about three inches back from the tip. Next a knot is tied on one end of the rope, while the other end is threaded through the two screweyes, thus forming an apparatus with which you can hold an animal while releasing it from a trap, by simply grasping the rope between the two screweyes and pulling it out so as to form a noose which can be slipped over the animal's head.

The dog should be approached in a friendly manner; do not carry or wave your stick in such a manner as to give the dog the impression you want to harm him. If the dog reacts in a friendly manner, walk right up to its side and give it an affectionate pat on the head with your hand. While talking to the dog, prepare your stick, and slip the noose over his head regardless of how friendly he may appear.

It is important that every attempt is made to have the dog standing up. It may be necessary to actually force the dog to remain standing by pulling up on your stick while at the same time pressing the dog against your own body or leg. To release the dog, hold him in this position, so that you compress both trap springs at the same time with your feet. Usually, after the trap springs are relaxed, the dog will lift his foot out of the trap voluntarily.

If the dog refuses to stand up it is necessary to force him to lie down on his side. To do this, pull your rope firmly, but not so tight as to choke the animal and wrap it around the stick three or four times. Next lay the stick flat on the ground and step on it. In this way the dog is held down while the

trap is removed with your hands. The importance of these precautions is to prevent as much unnecessary pain as possible.

There is another type of dog which you may find in your traps more frequently. This is the vicious half-wild stray. When you find a dog who absolutely refuses to show any trace of friendliness, it is well to remember that you are not expected to risk bodily injury in order to release such a canine. For when an animal shows its fangs, and growls, and you see the hair on its back standing up, it is a far better idea to disregard your stick, and use your revolver instead. It is obvious that such a dog is not accustomed to being befriended, and no doubt already has a long path of destruction behind it.

Destroying such a dog will not improve your set, however—in fact it will be ruined for weeks, or even a month or longer. It is usually a good idea to make a new set several hundred yards away from the original location.

It is good policy to release dogs unharmed whenever possible. You can be reasonably certain that a friendly dog is someone's property, regardless of whether or not he wears a collar. In such instances your conscience plays its role. At the same time, it is also possible that the dog is a valuable hunting dog which escaped from its master unknowingly. By releasing all reasonably friendly dogs you protect your set for future catches, you have a clear conscience, and possibly you avoid other undesirable situations.

Catching a dog in a fox set does not ruin the set in the true sense of the word. After a dog has been released, the old trap is removed, and a new clean trap is set. The odor of dogs around your set will last only a day or two, after which the average fox will come to your set without hesitating. Although

foxes and dogs are enemies, in most of our rural areas foxes have little or no fear of dog odors or scent as long as the dog itself is not present.

Cats, while not as frequently caught in fox traps as dogs, are released in the same manner as you would release a dog.

Shooting a cat in a fox trap ruins the set, and will necessitate making a new set some distance away. Otherwise a cat will not ruin the set, in

## CHAMPIONSHIP TOURNAMENTS PENNSYLVANIA STATE ARCHERY ASSOCIATION

### OPEN TARGET CHAMPIONSHIP

State College, Pennsylvania

August 30-31 and September 1, 1952

### OPEN FIELD CHAMPIONSHIP

Reading, Pennsylvania

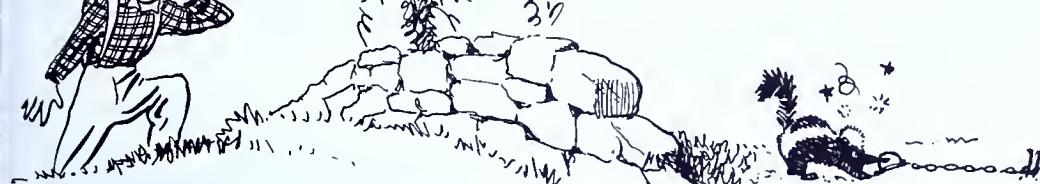
September 20 and 21, 1952

fact I am more inclined to believe that it might actually improve it.

Raccoon and opossums are two more animals which are generally not wanted in fox traps. Neither of these two animals will ruin a fox set unless they are shot at or near the set.

A possum is easily removed from the trap by simply lifting it by its tail and pressing down the trap springs with your feet. Whether it should be killed depends largely on the individual trapper's opinion of the animal's population in the immediate area and on the current laws.

Some trappers however, feel that a possum ruins a fox set. Without a doubt the nature of foxes varies in different sections of the State. In my own experience the digging which a possum usually does lends more authenticity to the whole thing.



om the foxes point of view.

A coon is considerably more difficult to release, requiring a lot of patience to get the rope noose over its head. After that it is merely a matter of holding the animal down on the ground while pressing down the trap springs.

The best way to release a skunk is to shoot it first! Scoop up as much blood as possible and discard it some distance from the set. This will not completely ruin the set, but either does it improve it.

I have found, however, that the skunk musk which is left at the set will override the trace of skunk blood, and this musk in itself is very attractive to foxes.

The problem of releasing skunk during closed season is quite a challenge. Some trappers claim skunk can be lifted by its tail without danger of being "skunked" if you can bring yourself to walk up close to a trapped skunk without hesitating, and without causing the animal to become alarmed.

Other trappers feel that by throwing a large burlap bag over a trapped skunk, they can be released without such precautions. A skunk will rarely throw its musk while rolled up in a burlap bag, or even as long as it is under the cover of such a bag. Seems they like to see where they are shooting, too!

. . . *The End*

## **Shoot With Both Eyes Open**

Hand a novice shooter a rifle or a shotgun and he'll almost always instinctively put it up to his shoulder and squint down the top of the barrel, closing one eye. Concentrating on one-eyed aiming seems the natural thing to do, but by so doing the shooter is unknowingly handicapping himself.

"Two eyes are better than one in any form of shooting," says Henry J. Davis, public relations manager, Remington Arms Company, Inc. Whether it be shooting at game in the field or at still or moving targets, the beginner should start out by learning to shoot with both eyes open. This will enable him to get a

clearer 'sight picture' much quicker and improve his chances to score a clean hit.

"Although at first it seems necessary for the beginner to sight down the barrel with one eye closed, with a little practice he will soon realize that it is much better to keep both eyes open and thus relieve himself of the unnecessary strain of squinting or closing one eye. The shooter uses only one eye in aligning his sights anyway, and that eye is his 'master eye.'

"Every one has a 'master eye' and the other is merely an auxiliary. This can be proved simply by pointing your finger at some object on the wall with both eyes open. Then close one eye at a time. You will find that

one eye will retain the sighting alignment along the finger, while the finger seems to jump off the target when the other eye is used exclusively. When both eyes are opened, the experimenter will find that the finger is still pointing at the target. The eye which retains the sighting alignment is the 'master eye.' The domination of sighting by the 'master eye' when both eyes are open is called 'sight accommodation.'

"Do the same thing with the gun. With both eyes open point the barrel at an object. If you are right-handed, close your left eye as your right eye will generally be your 'master eye.' The gun will still be aligned on the object. Now open your left eye and close the right. The barrel will seem to be pointing several inches to the right of the object.

"The great majority of expert riflemen shoot with both eyes open. This is particularly true when open sights are used. When peep sights are used, one eye is often closed until the sights are properly aligned and then opened. This greatly reduces eyestrain. In shooting with a telescope sight, a considerably lower percentage of experts shoot with both eyes open, but many of them wear a patch over the 'extra' eye to ease the strain of keeping it closed and some have tabs placed on the rear of the sight so that the eye which is snugged up close to the aperture is not interfered with.

"In field shooting at moving game with a telescope sight, it is best to keep both eyes open when bringing the rifle up to alignment. In this way the shooter does not lose sight of the target or game and does not experience difficulty and valuable loss of time in finding the target in the restricted field of his lenses. The idea is to get on the target as quickly as possible and this can best be done by keeping both eyes open.

"Practically all expert pistol shooters shoot with both eyes open. After all shooting a pistol is just like pointing your finger and a natural and comfortable stance always makes for better marksmanship in any kind of shooting.

"Many expert pistol and rifle shots have trained themselves to shoot with one eye closed and if they are making good scores consistently with this method, it is not recommended that they switch over to two-eye or binocular shooting at once. But the type of shooting is to be encouraged always and in the vast majority of cases an improvement in marksmanship will soon be noted.

"The best shotgun shots, whether it be at game or clay targets, always shoot with both eyes open. The scatter-gun artist seldom sees his sights, or, in many cases, even his gun barrel. His eyes are constantly on the target or game, and he trains himself to instinctively swing the gun in perfect alignment. When the shooter learns to make the gun a part of himself, shooting becomes comparatively easy. When he learns to lead flying or moving targets properly, he approaches perfection.

"Every shooter should practice gun handling until the gun seems to become a natural part of the body," says Davis. "Some shooters seem to almost tie themselves into a knot when shooting at moving targets. They are constantly 'working on' their guns instead of making the gun work for them. Many build up mental obstacles which are reflected in their scores, but the fellows who really bring home the bacon are the ones who put into actual practice the old slogan of 'Easy Does it.' The fact that everyone can always see better with both eyes open needs mentioning only as further proof that shooting with both eyes open maintains the natural balance of vision. You can't hit 'em unless you can see 'em.'



# CONSERVATION NEWS



## In Memoriam



**ROBERT LAMBERTON**

Robert Lamberton, Franklin, President of the Pennsylvania Game Commission since January of this year, died at the age of 66 on July 20, following a brief illness. His noteworthy career with the Commission began with his appointment in March, 1935, and he served as vice-president of the game body since January, 1942.

Lamberton was active in sportsmen's organizations, was an ardent hunter and fisherman, and was the owner and handler of outstanding grouse dogs, one of which became Grand National Champion.

The deceased was well versed in the out-of-doors and deeply interested in wildlife management and preservation. His absence from the conservation field will be felt not only by the Commission and his many friends elsewhere, but also by the rank and file hunter throughout the Commonwealth.

## SEASONS AND BAG LIMITS SET BY COMMISSION

On the morning of July 1 the Game Commission met in Harrisburg with representatives of 12 of 16 organizations invited to air their views on the upcoming game and fur seasons.

Listed alphabetically, the representatives, seriously interested in the management of the state's wildlife resources, came from: Allegheny National Forest; Pennsylvania State Archery Association; Bow Hunters Association of Pennsylvania; State College Cooperative Wildlife Research Unit; 4 regional duck hunter organizations; Federation of Sportsmen's Clubs (Pennsylvania); 2 independent sportsmen's organizations; and the Pennsylvania Trappers' Association.

Each delegate was afforded time in which to amplify orally the recommendations submitted in writing by those he represented. Suggestions made to the Commission were offered in a temperate, cooperative tone. They indicated that the future of the hunting sport and trapping interests were long and carefully weighed before season and bag limit suggestions were listed for the consideration of the Game Commission.

Immediately following this meeting the Commission set the following seasons and the daily, season and possession limits for the taking of game birds, game animals and fur-bearers during the hunting license period of September 1, 1952 to August 31, 1953.

### SMALL GAME

The hunting season for ruffed grouse, wild turkeys, male ringneck

pheasants, gray, black and fox squirrels, and cottontail rabbits will run the full season, November 1 to 29, inclusive. Limits on them are: grouse, 2 a day and 6 the season; turkeys, 1 and 1; pheasants (cocks only), 2 and 8; gray, black and fox squirrels (combined), 5 and 20; cottontail rabbits, 4 and 20.

The counties and parts of counties closed to wild turkey hunting last season will again be closed this fall. The entire county of Butler is added to the list closed to wild turkey hunting. The length of the season on grouse is increased 2 weeks over that of 1951, but the daily and season limits remain the same as last year. The daily squirrel bag is increased by 1 over last year, making it 5, but the season take of 20 is the same.

The period for taking bobwhite quail will be November 1 to 15, inclusive. The daily bag was set at 4, with a limit of 12 for the season. Hungarian partridge hunting will not be permitted this year. Bronze and purple grackles may be shot throughout the license period in unlimited numbers. The regulations governing grackle hunting apply to the taking of red squirrels, except that red squirrels may not be hunted in October.

Hares (snowshoe rabbits) may be taken 2 a day, 6 the season, January 1 to 10, inclusive, in 1953.

Regulations on woodchuck (groundhog) hunting have been modified. This game animal may not be hunted continuously (Sundays excepted) until September 30, 1953, except during the month of October. The daily limit continues at 5, with no season limit. From July 1 to September 30, inclusive, the shooting hours for woodchucks will be 6 a. m. to 7:30 p. m., eastern standard time. Otherwise, the regular shooting hours are 7 a. m. to 5 p. m., E.S.T.

Raccoons taken by either the hunting or trapping method remain at 5 a day, with a combined limit of 40

the season. The dates for coon hunting and trapping are the same for the two methods, October 15, 1952 to February 1, 1953, both dates inclusive.



Regulations covering possession and transportation limits of legally killed small game are the same as last year. They allow not more than the daily limit for the first day nor more than an accumulated total for each succeeding day of the open season for each species. But small game shall not be in excess of the season limit, regardless of where held, stored or found in possession.

## BIG GAME Bears

The season on bears is November 17 to November 22, inclusive. An individual may take one bear over one year old in the season; a hunting party of 3 or more persons may take 2 in one day, but not more than 2 in the season.

## Deer—By Bow and Arrow

The archers' season, October 13-25 inclusive, is for male deer only, those with two or more points to one antler. In addition to the regular hunting license, every bow hunter without exception, must procure special archery license costing \$2.00 from the Department of Revenue only, at Harrisburg, in order to hunt deer during the special bow season.

### Antlered Deer Season

A state-wide two week "buck" season, that for male deer with two or more points to one antler, will extend December 1 to 13, inclusive.

### Antlerless Deer Season

Aiming to reduce the deer herd somewhat more than the previous two-day seasons accomplished, the Commission set Monday, Tuesday and Wednesday—December 15, 16 and 17—as the period for taking antlerless deer. The season will be state-wide. A special "doe" license costing \$1.15, must be purchased. It may be obtained at the office of the county treasurer in the county where the applicant will hunt antlerless deer. "Doe" hunters must first own a "regular" hunting license before they can obtain one for antlerless deer. However, persons who can legally hunt on certain lands without a resident hunter's license, may also hunt antlerless deer on the same lands without an antlerless deer license. County quotas, based on a survey made by the Commission, will be announced soon. "Doe" licenses will not be on sale for some time. The public will be informed when they are available.

No application for an antlerless deer license shall be approved or license issued to a nonresident prior to November 15 or after December 14.

A legal hunter may kill one deer but may not kill more than one deer during the three combined deer seasons, whether he hunts as an individual or with a camp or hunting party.

There will be no open season on hen pheasants, Hungarian partridges, cub bears, elk and spike bucks, and otters, in 1952.

The opening hour of small game season, the regular buck season, and the antlerless deer season will be 9 a. m., with the closing hour 5 p. m. On the other days of these seasons

the hours are 7 a. m. to 5 p. m., Sundays excepted. The hours for the bow and arrow deer season and the bear season are 7 a. m. to 5 p. m. daily, throughout the season. All shooting hours are based on eastern standard time.

### FUR SEASONS

The mink trapping season will again extend from November 5 to



December 15, inclusive, with no limit on the take. Unlimited numbers of muskrats may be trapped November 29, 1952 to January 15, inclusive, 1953. There is no open season on otters.

The beaver season was extended from 2 to 3 weeks. It runs from February 16 to March 7, inclusive, 1953. The number of these fur-bearers that may be taken was also increased. Trappers will be allowed 3 in one day or 3 the season throughout the Commonwealth. Certain beaver dams will be closed and posted against taking "flat tails" wherever the Executive Director of the Game Commission deems it advisable to protect the stock.

Skunks and opossums were again placed on the unprotected list. They may be taken in unlimited numbers until September 1, 1953.

For easy reference the new seasons and bag limits are listed in chart form on the following page.

# Pennsylvania Official 1952 Open Seasons and Bag Limits

Open season includes first and last dates listed, Sundays excepted, for game.\* The open hour for small game on November 1, buck hunting on December 1, and antlerless deer hunt on December 15 will be 9:00 A. M. Otherwise, upland game shooting hours daily are from 7 A. M. to 5:00 P. M., but from July 1 to September 30 inclusive, 6:00 A. M. to 7:30 P. M. (shooting hours based on Eastern Standard Time.)

	BAG LIMITS		OPEN SEASONS		
	Day	Seasons	First Day	Day	Last Day
UPLAND GAME (Small game possession limits below)					
Bobwhite Quail .....	4	12 ....	Nov. 1	....	Nov. 15
Ruffed Grouse .....	2	6 ....	Nov. 1	....	Nov. 29
Wild Turkeys (see counties closed below)* .....	1	1 ....	Nov. 1	....	Nov. 29
Ringneck Pheasants, males only .....	2	8 ....	Nov. 1	....	Nov. 29
Rabbits, Cottontail .....	4	20 ....	Nov. 1	....	Nov. 29
Squirrels, Gray, Black & Fox (combined) .....	5	20 ....	Nov. 1	....	Nov. 29
Squirrels, Red (closed October only) .....		Unlimited ....	All mos. except Oct.		
Hares (Snowshoe Rabbits) .....	2	6 ....	Jan. 1	....	Jan. 10,
Raccoons, by individual or hunting party* .....	5	.....} ....	Oct. 15	....	Feb. 1,
Raccoons, by trapping* .....	5	.....} 40 ....	Oct. 15	....	Feb. 1,
Woodchucks (Groundhogs) (closed October only) .....	5	.....} Unlimited ....	All mos. except Oct.		
Grackles (unprotected) .....		Unlimited ....	Unprot. to Sept. 1, '53		
Bears, over one year, by individual .....	1	1 ....	Nov. 17	....	Nov. 22
Bears, as above, by hunting party of three or more .....	2	2 ....	Nov. 17	....	Nov. 22
<b>Bow and Arrow Season</b> —Male with two or more points to one antler (requires hunting license and special archery license) by individual*					
DEER:	Regular Season	—Male with two or more points to one antler, by individual* .....	1	..... 1 ....	Oct. 13 ..... Oct. 25
	Antlerless Season	—(requires hunting license and antlerless deer license) by individual*			Dec. 1 ..... Dec. 13
					Dec. 15 ..... Dec. 17
<b>NO OPEN SEASON</b> —(Hen Pheasants, Hungarian Partridges, Cub Bears, Elk, Spike Bucks and Otter)					
<b>FURBEARERS:</b>					
Skunks and Opossums .....		Unlimited ....	Unprot. to Sept. 1, '53		
Minks .....		Unlimited ....	Nov. 5	....	Dec. 15
Muskrats .....		Unlimited ....	Nov. 29	....	Jan. 15,
Beavers (traps only), state-wide* .....	3	..... 3 ....	Feb. 16	....	Mar. 7, '53

## \* SPECIAL REGULATIONS

**POSSESSION AND TRANSPORTATION LIMITS** of legally-killed small game shall mean not more than the daily limit for the first day nor more than an accumulated total for each succeeding day of the open season for each species; but not in excess of the season limit, regardless where held, stored or found in possession.

**TURKEYS, COUNTIES CLOSED TO HUNTING**—Adams, Armstrong, Butler, Fayette, Greene, Mercer, Somerset, Venango, Westmoreland and York. In addition, that part of Cambria west Highway Routes Nos. 271 and 56; that part of Cumberland south of U. S. Highway Route No. 22 to the west shore of the Susquehanna River; and that part of Franklin south and east U. S. Highway Route No. 11 are closed.

**RACCOONS**—Hunting season begins at 7 A. M. on the first day, and ends at noon on last day (see instructions below concerning trapping). May be hunted day or night, Sundays except. The season limit applies to hunting and trapping combined.

**DEER**—Even though there are three separate seasons for taking deer, a hunter may not kill more than one deer during the three combined 1952 seasons, whether hunting individually or with a camp or hunting party. A Special Archery License is required during Bow and Arrow Season issued only by the Dept. of Revenue, Harrisburg, at a fee of \$2.00. Antlerless Deer Licenses are issued only by County Treasurers, at a fee of \$1.15, and valid only in the County for which issued. Farm occupants permitted by law to hunt without a license may also hunt for antlerless deer during the antlerless season on the same lands as for other game. See Digest Issued with hunting license for details. Under the law, no application for an Antlerless Deer License shall be approved, or license issued, to a Nonresident prior to November 15, or after December 14, 1952.

**BEAVERS**—No trapping at Commission-posted dams. Nonresidents may not trap beavers. One person may set, tend or operate 10 traps only. Traps must not be set on the structure of a beaver dam or house, or within 25 feet of the waterline on the structure of either there. Tags must be kept above ice or waterline to facilitate identification without disturbing traps. Pelts must be tagged within 10 days after season, and may not be sold or otherwise disposed of until properly tagged. Present them to the Game Protector in District or County where trapped.

**TRAPPING**—Traps for furbearers and raccoons not to be placed, staked or set before 7 A. M. on the first day of the open seasons. The season indicated for Trapping closes at 12:00 o'clock Noon on last day. Traps must be tagged with metal name tags.

**SNARES**—The use of snares is prohibited in all counties except by special permit.

## REGULATIONS FOR UPLAND GAME FIXED BY PENNA. GAME COMMISSION AT MEETING JULY 1, 1952.

1952 HUNTING LICENSE IS VALID SEPT. 1, 1952 TO AUG. 31, 1953, BOTH DATES INCLUSIV

## 0,000 Prize Offered In Trap Design

An offer of a \$10,000 reward for a humane trap that will be acceptable to commercial trappers as a substitute for existing steel-jaw traps was announced today on behalf of the American Humane Association by El L. Morse, the Association's Executive Director.

The American Humane Association is the national federation of more than 600 local and regional humane societies in the United States and Canada. Its headquarters is in Albany, N. Y.

Morse said that the only stipulation about design or construction of the trap sought is that it must hold

a trapped animal without harm or kill it instantly and that the trap must be commercially acceptable as a substitute for traps now commonly used.

"The American Humane Association has only a humane interest in making this offer," Morse said. "Patient rights will remain the property of the inventor. We are offering the \$10,000 reward merely as an incentive to inventive thinking. We hope that we can help, with this reward, to develop a trap that will minimize the suffering which is an unavoidable result of trapping."

Details of the reward offer can be obtained by writing to Lester A. Giles, Jr., Director of Wildlife Department, American Humane Assn., 135 Washington Ave., Albany, N. Y.

## COMMISSION SETS ANTLERLESS DEER QUOTAS

The Pennsylvania Game Commission has designated December 15, 16 and 17 as the antlerless deer season for 1952. This should remind the hunters that under an Act passed by the 1951 Legislature, the Commission has the responsibility of regulating the kill of antlerless deer by controlling the number of antlerless deer licenses to be issued in any county. These are made available in sufficient numbers to ensure an adequate "doe" harvest.

In 1951, the Commission issued 225,000 antlerless deer licenses and hoped that 75,000 deer would be harvested. This reduction in the deer herd was necessary to bring it into balance with its food supply and to decrease crop damage. However, only about 38,000 hunters were successful because of inclement weather during the two-day season, and as a result many thousands of deer died of starvation during the past winter.

A study of the 1951 antlerless deer harvest, which was for only two days, revealed that only one in 10 hunters killed a deer in predominantly agricultural counties, one in 8 in counties where the agricultural land and forested areas are nearly equally divided, and only one in 5 in the truly "big woods" counties.

The antlerless deer licenses for 1952, which will be for a three-day season, December 15, 16 and 17, will be allocated on the basis of hunting success as related to the food conditions and the deer population of each county.

That is, for each antlerless deer, 6 licenses will be issued in each of the agricultural counties, 5 in the agricultural-forested counties, and 4 in each of the "big woods" counties.

For 1952, the desirable antlerless deer harvest has been set at a minimum of 50,000 for the State. The percentage of this total to be harvested in the individual county is based upon the reported number of legal antlered bucks killed in each county as related to the total kill in the State during the past three years. This formula provides an allocation of 224,660 antlerless licenses for the State.

This scientific approach to the "doe" harvest should ensure a satisfactory antlerless deer kill in each county and will safeguard against over-shooting where the deer population is sparse. It will also help prevent dangerous concentrations of hunters in the "big woods" counties.

The number of antlerless licenses that will be available for issuance by the County Treasurers of the various counties for the 1952 season will be as follows:

Adams .....	750	Lackawanna .....	1600
Allegheny .....	360	Lancaster .....	240
Armstrong .....	2280	Lawrence .....	450
Beaver .....	570	Lebanon .....	900
Bedford .....	4400	Lehigh .....	390
Berks .....	1410	Luzerne .....	5020
Blair .....	2975	Lycoming .....	8680
Bradford .....	4540	McKean .....	10920
Bucks .....	630	Mercer .....	1080
Butler .....	2250	Mifflin .....	2350
Cambria .....	2375	Monroe .....	5150
Cameron .....	5980	Montgomery .....	2100
Carbon .....	2275	Montour .....	2700
Centre .....	8340	Northampton .....	6000
Chester .....	330	Northumberland .....	1170
Clarion .....	2825	Perry .....	2920
Clearfield .....	8580	Philadelphia .....	...
Clinton .....	7580	Pike .....	5700
Columbia .....	1975	Potter .....	13800
Crawford .....	3030	Schuylkill .....	3670
Cumberland .....	1140	Snyder .....	1230
Dauphin .....	1775	Somerset .....	5800
Delaware .....	60	Sullivan .....	5100
Elk .....	11000	Susquehanna .....	3670
Erie .....	1980	Tioga .....	8000
Fayette .....	2400	Union .....	1570
Forest .....	7480	Venango .....	4420
Franklin .....	2250	Warren .....	9060
Fulton .....	2050	Washington .....	2100
Greene .....	450	Wayne .....	4160
Huntingdon .....	5400	Westmoreland .....	4420
Indiana .....	3690	Wyoming .....	2550
Jefferson .....	3550	York .....	6000
Juniata .....	1925		
		TOTAL .....	22466

#### YEARLY BOUNTY REPORT

During the last fiscal year of the Game Commission, ending May 31, bounty paid out of the game fund on noxious birds and animals totaled \$226,014. Rewards were paid on the legally submitted skins of weasels, gray foxes and red foxes, and the bodies of great horned owls in that 12-month period. The number of claims paid in the last fiscal year totaled 18,830.

Potter County led the state with \$11,046 in bounty money received. Tioga was close behind, with \$9,570. Bradford received over \$8,000. McKean, Crawford and Somerset got over \$7,000 each. Clearfield, Erie, Warren and Greene received over \$6,000. Jefferson, Lycoming and York Counties got predator bounty in excess of \$5,000.

## COMMISSION WATERS OPENED FOR IMPROVEMENT

To expedite desirable improvements in fishing and fish propagation in streams, lakes and other waterways under the management and control of the Pennsylvania Game Commission, an agreement of understanding was recently signed between the Game body and the Pennsylvania Fish Commission. The terms of the agreement are as follows:

(a) Fish Commission shall give the Game Commission written notice of contemplated improvement before proceeding with any project;

(b) Fish Commission shall not make any change in the condition or nature of any such waterways that will in any way interfere with the use of said waterways by the Game Commission;

(c) Fish Commission shall make improvements in accordance with the laws, rules and regulations of the Commonwealth and its Departments;

(d) In granting this permission it is understood that such improvement and management by the Fish Commission shall not be a bar to or interfere with any action by the Pennsylvania Game Commission or impede the free use of the land by the Commission.

It is further understood that this agreement may be cancelled by either Commission upon six months' notice, in writing, to the other.

### Finnish Conservation Studies In U. S.

With the thought that Pennsylvanians are so close to their own wildlife problems they may not realize that other states and nations have theirs also, this story of a conservation-trained visitor from across the ocean may be of interest.

Teppo Lampio, representing the Finnish Game Research Institute at

Helsinki, recently visited the office of the Pennsylvania Game Commission. His stay in Pennsylvania represents a part of a tour of the U. S. sponsored by the Federal Government. He is studying the organization and work of the various state conservation departments and commissions with the intent of applying his findings toward the improvement of his own country's wildlife conservation program.

Finland, which is about the size of the State of California has a population of 4,000,000. The 150,000 hunters in that country bag several hundred thousand of their two species of grouse annually.

Because only 10 per cent of Finland is farmed, most of the hunting is provided by forest game. Their black grouse weighs 4 to 5 pounds but the capercaillie reaches the size of our wild turkey sometimes weighing as much as 15 pounds. Two thousand moose were harvested in Finland last year, and many snowshoe hares, European hares, and Finnish red squirrels were taken. The red squirrel pelts sell for about one dollar. They were used for centuries as money in the Baltic country.

Finland has many university-trained game technicians, and is now planning to establish a school for game managers. Pennsylvania's conservation school for game protectors, the first in the U. S., was of particular interest to Mr. Lampio.

### Bear Damage Claims Paid In Thirteen Counties

In the twelve-month period ending May 31, 1952, forty bear damage claims totaling \$1,532.63 were paid from the Game Fund.

Claimants in 13 counties were compensated for losses suffered by bruins. Potter County had the dubious distinction of again being first, with 11. Tioga took second place with 5. Mc-

Kean and Monroe tied for third with 4 each. Elk and Jefferson reported 3. Centre, Clarion and Luzerne followed with 2 apiece. Clearfield, Clinton, Lycoming and Warren each made one legitimate bear damage claim.

As usual, destruction to bee hives, frames and honey topped all other claims. In 33 such claims 84 items drew repayments amounting to \$1,197.93. Ten sheep and one calf were destroyed by bruins in the year given, for a total of \$334.70 in restitution.

In the twelve-month period ending May 31, 1951, \$984.65 was paid from the Game Fund on 34 bear damage claims.

### **Missouri Group Tackles Farmer-Sportsman Problem**

The Lee's Summit Wildlife Federation of Missouri, founded in 1936, has been taking a forthright approach to the growing farmer-sportsman relationship problem according to the Wildlife Management Institute.

Private agricultural lands open to unrestricted hunting without permission are becoming scarcer annually in Missouri as they are in all other states. To forestall the closure of private lands, the Lee's Summit Chapter devised a system under which landowner-cooperators post their lands with "hunting by permission" signs. Official permits are distributed to farmers who are dues-paying members of the group for distribution to hunters requesting permission. Provisions are made for closing particular areas during seasons of wildlife scarcity or when snow is on the ground. The permits give the cooperating farmer an opportunity to control the take of game on his land and to exclude game hogs and vandals. The Chapter offers a cash award for information leading

to the arrest of persons damaging property of the farmer or for remeeting or defacing the signs. In the list of instructions furnished to all members, it is recommended that those requesting privileges on these areas hunt alone or in small groups and avoid the mass hunts that are so objectionable to many farmers. Although provision is made for landowners to charge for hunting rights,

### **NEW OPENING DATE FOR DOG TRAINING SEASON**

For years, the Pennsylvania dog training season has opened on August 20. Starting this summer, the season opens August 1st. The end of the period remains March 31.

Authorization for the 20-day extension of the training season arises from a 1951 Legislative Act.

on their property if they so desire, none have taken advantage of the provision to date. J. Stuart Davis, director of public relations for the Chapter, reports that this controlled hunting program has eliminated complaints of landowners against unscrupulous hunters and game hogs.

In addition to these services, the society provides landowners with planting materials for use in developing better wildlife habitat on the lands. The group hopes within the near future to develop a recreation and demonstrational area similar to the Tea Lake project undertaken by the St. Louis South Side Chapter of the Missouri Wildlife Federation.

Most of the current membership consists of sportsmen-landowners from Jackson County, but within recent months sportsmen from Kansas City and its suburbs have recognized the advantages of the program, and membership is increasing steadily.



H.S.

### By Horace Lytle

Dear Son:

I can't tell you how pleased I was at, having no game scheduled last tursday, you were able to join me for those two wonderful days in Ashtabula County hunting woodcock. It meant much to me in many ways. I have seen birds more plentiful—but not too often. Above all, I have never seen you so manifestly enjoy a hunting trip. This, as you told me before saw you on the train to return to school, was because you loved the solation—and the woods. Both have ways lured you strongly. That's why you're a real outdoorsman—why you have felt the spell of the wilderness since you were but a little boy. Why you thrilled to every minute of a full month on Spruce Lake with no playmates—and didn't miss them—and didn't want to go home when the time came that we must.

Until our two days last week, you have really never been hunting for

anything but pheasants. The constant conflict with other hunters, switching direction this way and that to avoid competition, not to mention having to be ever alert that our dogs avoid injury from trigger-happy gun-goons —just doesn't appeal to you. Nor to me, either! The only answer is that one can't have everything; and I am always on the lookout for places to hunt where much of such hazard is avoided. I have just recently lined up several such locations.

When you were ten years old, and I took you hunting with me for the first time, you were thrilled and your mother vowed thereafter that she wasn't raising her boy to be a hunter. She gave me fair warning that in every subtle way possible she would try to influence you against it. I've never tried to influence you either way, but am going to tell you something now. I showed an early love for hunting that would not down. The

limitations of boyhood prevented me from getting as much as I'd have liked. However, I was at it early and late as much of the time as I could manage. Then, along came football—first in high school, later in college and semi-pro, before the days of professional football as it is organized today. Thus football, coupled with courtship of your mother and trying to get some sort of a toe-hold in the business world, sort of took me out of hunting for several seasons. And a strange thing happened: I got the idea that I didn't care to kill things any more. You might say I'd gotten out of the habit of hunting, so to speak.

And then one day I was invited to go quail hunting in Illinois. And on that trip all the old lure swept back full-fold—doubled and redoubled. I doubt if I had ever before been quite so thrilled—and, perhaps, not since. The first kiss comes but once! Suffice it to say I was back in the current, and have never been out of it since.

About the time of that Illinois hunt I same across a book that I treasure greatly—and which you, too, have read and enjoyed. I refer to *School of the Woods* by Wm. J. Long, a book every lover of nature should read many times. The last two chapters are titled The Gladsome Life, and How The Animals Die. Both are revealing. From page 330 I quote this: "That their pain is very slight compared with ours is absolutely certain. I have found animals in the woods, bruised, wounded, bleeding, from some of the savage battles they wage among themselves in the mating season. The first thought, naturally, is how keenly they must suffer as the ugly wounds grow cold. Now comes Nature, the wise physician. In ten minutes she has them well in hand. They sink into a dozy, dreamy slumber, as free from pain or care as an opium smoker. And there they stay, for hours or days, under the soft anesthetic until ready to range the

woods for food again or till death comes gently and puts them to sleep."

How marvelous are the ways of the Creator! I still fret, as you know, over causing undue pain to any wild thing and will work my head off quickly to capture cripples—making the dog work hard at it, too. But if one squirrel does get away, and I can't help it, I no longer lose the sleep over it that I otherwise might had it not been for Long's really great book. I neither like to cripple a bird nor lose it that is. *NO indeed!* But if it happens and I've done all I can, well—that's that.

Speaking of that Illinois hunt that I mentioned a minute ago, reminds me that we brought home a lot of birds. Our host, George Roberts, is rated as one of the great quail shooters I have seen—and I've seen most of the best. One day we stopped the car at a likely looking spot and the dogs were on point before we were out with our guns. We flushed a big covey and the shooting flushed another a large one close by. They all pitched into a relatively small thicket beyond an old rail fence. We spread out through this cover and emerged with 32 birds. Telling of this later back home, one of city's older hunters rebuked me severely for boasting of bagging so many birds in such short order. That was a long time ago; and as I think back on it now, I believe it was the first time I had ever heard any hunter himself deplore the taking of too many birds. It was the beginning of an awakening within me, still thrill as much as ever to make a reasonable number of clean kills when the circumstances of game supply warrants. But any glutinous killing is revolting. I just can't stomach it at all. And yet I wish—as much as any man could—that our game supplies today were such as to stand a somewhat better dividend out of surplus.

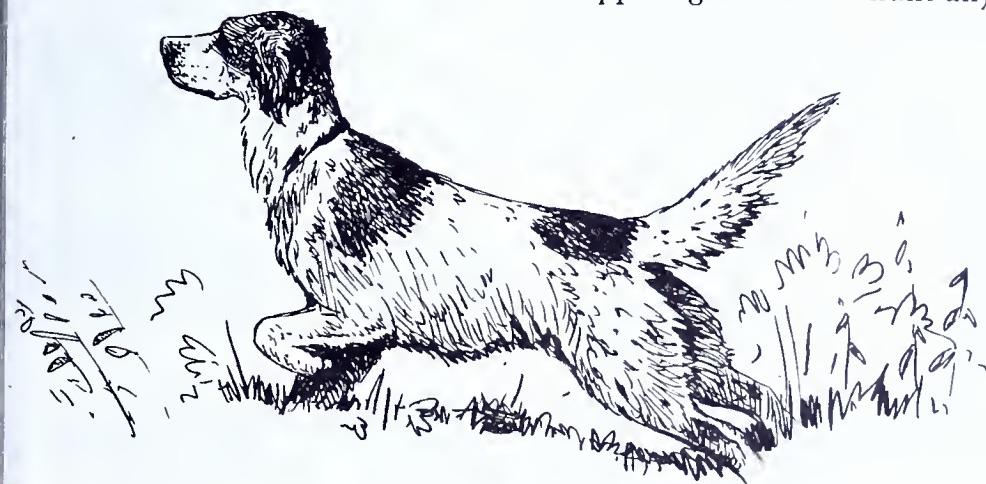
Writing you of these things, my mind turns back to Mississippi hunting as I knew it prior to 1930. When

ut hunting either too hard or too long, 30 covies a day was but normal; and half again that many was possible by spending more time afield. In those days I could walk with the ugliest and never thought of anything else in the North. But I'm going to admit to you, my boy, that I ved that Southern horseback hunting best of all! As you know, I kept y own horse, "Bud," in Mississippi I year 'round and he was fun to de. I love riding a good horse, anyow, and hunting thus combines two easures. In that open country the ogs range wider when you're ounted and I love that, too. Also, ou can see them better and get to hem quicker when they point. And ou're not out of breath when you et there. You have but to dismount and are all set to shoot—rested and ady. Bud was trained to stay ground hitched," as you yourself will member. Funny thing about that: ist drop the reins over his head and e'd stand there indefinitely, even ith shooting going on; yet turn him ose without saddle or bridle, and ou couldn't lay hands on him again l day—he'd join the mules and roam ith them until feeding time. But m straying from what I meant to ll you—

15 birds a day was the Mississippi limit then and the law allowed taking home two limits, or 30 birds. I always killed a limit each of the last two days of my month—and always knew I could. Until these last two days I never killed more birds than we needed for the table. Some days that would be but 3 or 4, sometimes more but never many. I remember one hunt with Betty, one of the sweetest running Setters I've ever owned—or seen. The day was pretty warm so I didn't stay out long, but she hunted beautifully and I quit after she had found one covey. I shot twice and dropped 2 birds on the rise. The first was stone dead and she retrieved it quickly. The second was a cripple and managed to crawl into a muddy hole. Betty had to dig to reach it—but she did and brought it out. I rubbed her with sedge to remove the worst of the mud, especially from her eyes, then took her up on the saddle with me and rode back to Harmontown. Stopping at the store for a coke, I was asked what kind of luck I'd had.

"Great," I said—"Betty was wonderful."

How many *birds*, though, they wanted to know—and when I answered just *two*, I was in for some kidding. One friend laughed and said to the group: "You know, the law oughta be changed in his case—Mississippi oughta let him hunt any time



of year at all. A fella who can have that good a time with *two* birds wouldn't hurt 'em none."

It wasn't too long after that, though, before our whole country was the victim of two most unfortunate visitations: The Great Depression and the Great Drouth. The former should have been favorable to game because ammunition was so expensive. You can't buy much of anything on 5c cotton. Game nowhere in this country, however, has staged any noteworthy come-back since the drouth. No longer could I count on bagging two Mississippi limits in two days. Nor even in two weeks! There were even years when I brought home no birds at all. One year, I recall, I brought five. Another season I never took either of two guns from their cases—and never sighted a single bird over a gun barrel. I just had no heart for it. I spent an entire month trying to get the dogs ready for field trials, which is hard to do without game. I remember one lucky work-out that year when Linda found four covies, and a friend killed one bird over each of her four points—which did her good. It's a sad commentary to consider how many professional trainers have had to come down to using live pigeons of late years in stanching their dogs to point.

I don't know the answers to all of these things—though I do think I know some of them. These are a few I feel sure of: 1. We must look to the *class* dog, rather than kills, for our thrills; 2. We must find a way to keep mere trigger-happy gun-goons out of our covers and fields (it would be a great day if no hunting license were issued until after applicant has passed a rigid examination—not merely in proper gun handling, but in all that makes for a test of the true sportsman: the very *right*, if you please, to be granted a license); 3. A hunting license should cost more—*much more*; you can't expect to dance unless prepared to pay the fiddler.

Well, those are some of my long thought-through beliefs, dear boy, and it will be up to your generation to see them through. You know you always must first *see through* a thing, then *see it through*.

Good night—good luck—and God bless you.

DAD.

When the bat is at rest, its wings wrap around the body like a cloak.

\* \* \*

The African fingered frog resembles man in that it gathers food with its hands and not with its mouth.

\* \* \*

An electric ray fish weighing 1 lbs. can discharge enough electricity to knock a man down.

\* \* \*

The bear moves with an awkward or shuffling gait because he has no clavicle to keep the shoulder bones steadily apart. Thus, as the forelegs are moved, the blade-bone "works" much more on the side than is usual in animals.

\* \* \*

Otters, when hunting for fish, always swim up stream. This is because fish, when waiting for food, reposing, have their heads up out of water. The otter can more easily approach them from behind.

\* \* \*

An ostrich egg weighs about three pounds and holds approximately as much as a dozen and one-half chicken eggs.

\* \* \*

The biggest bats in the world are found in the Old World tropics and are popularly called flying foxes. They have a wing-spread of about five feet.

\* \* \*

The horned toad is not a toad. It is a lizard. It does not lay eggs, but gives birth to living young.

# Books For The Outdoorsman

## THE TREES OF PENNSYLVANIA

By William C. Grimm

3 pages. Profusely illustrated with black and white line drawings by the author. Published by The Stackpole Company, Telegraph Press Building, Harrisburg, Pa. Price .00.

It's been a long time since a book on trees has been greeted with the enthusiasm accorded Bill Grimm's *TREES OF PENNSYLVANIA*. Folks of scientific turn of mind as well as nature lovers of the garden variety are equally pleased with this modern successor to Illick's *PENNSYLVANIA TREES*, which has been out of print for more than two decades. It treats not only all native Pennsylvania trees but also the more important introduced species.

Identification is simplified by two keys, one listing winter characteristics, the other summer characteristics. Splendid line drawings of each tree show at a glance all details of leaf shape and arrangement, fruit, leaves, flowers, etc.

The text accompanying each drawing describes chief identifying characteristics for different seasons of the year, dimensions and form, use by wildlife, economic importance, distribution, and other interesting details.

All in all, *THE TREES OF PENNSYLVANIA* is the most important publication of its kind to put in an appearance in many years. Covering, as it does, nearly all the trees in northeastern United States, the very scope of this work should assure it a place in the outdoorsman's bookshelf.

## THE SHRUBS OF PENNSYLVANIA

By William C. Grimm

2 pages. Profusely illustrated with line drawings by the author. Published by The Stackpole Publishing Company, Telegraph Press Building, Harrisburg, Pa., 1952. Price .00.

For some inexplicable reason books on shrubs have always been conspicuous by their absence, but here, in the companion volume to *THE TREES OF PENNSYLVANIA*, William C. Grimm has filled the gap in

## BOOK NOTES



fine style. Embracing almost 150 species of shrubs this work includes practically all those found in the entire northeastern United States.

Each species is illustrated by the author's authentic line illustrations drawn from nature, and the text follows the same pattern incorporated in its sister volume.

A special combination of *THE TREES OF PENNSYLVANIA* and *THE SHRUBS OF PENNSYLVANIA*, in a boxed gift set, is offered at the price of \$9.00—one more reason why the outdoorsman will want both of these authoritative books.

## THE FLIGHT OF BIRDS

By John H. Storer

94 pages. Fully illustrated with photos and line drawings. Published by the Cranbrook Institute of Science, Bloomfield Hills, Michigan. Price \$2.50.

One of the most interesting books in the ornithological field is this little volume devoted to answering the age-old questions about "what keeps them up there". Mr. Storer, bird photographer extraordinary, explains the mechanics of avian flight so simply that even the rank amateur can quickly come to a complete understanding of this puzzling process. His magnificent action photographs of birds in flight reveal details of flying technique that might come as a surprise to the most learned ornithologist. Incidentally, no one could derive more benefit from this book than the bird artist; his paintings could not fail to exude life, action and realism with *THE FLIGHT OF BIRDS* as a reference and inspiration.

## DAYS WITHOUT TIME

By Edwin Way Teale

283 xiv pages. Illustrated with 144 photographs by the author. Published by Dodd, Mead, and Company, 432 Fourth Avenue, New York 16, New York. Price \$6.00.

Edwin Way Teale is one of those rarest of individuals who possess the keenness of perception to find beauty in a seemingly insignificant clump of grass; mystery in a lace

bug; grandeur in a mud flat; and magnificence in a twisted root. Coupled with this unusual ability, the author has a facility with the written word which enables him to pass on to his reader the thrill he feels at each new discovery; the suspense of watching a hatching insect egg, or the humor and pathos in the lives of squirrels, starlings, sea birds, and mollusks. In short, Mr. Teale is a naturalist and author in the tradition of John Burroughs, Henry David Thoreau, and Jean Henri Fabre.

As in his previous volumes, *Grassroot Jungles*, *The Golden Throng*, *Near Horizons* and *The Lost Woods*, the author has supplemented his text with a wealth of photographic illustrations, which capably mirror the beauty of the prose.

Teale's hunting grounds, from which he has derived most of the material for his volumes, are within a short radius of New York City. The city-bound nature lover, who feels that he can find no adventure in the realm of nature without traveling hundreds of miles, will find much to open his eyes in the pages of this book.

## BIRDS IN YOUR BACK YARD

By Ted Pettit

209 x pages. Illustrated with 11 plates of bird drawings by George Grelle, numerous line drawings by Donald Ross, and 18 half-tones. Published by Harper and Brothers, 49 East 33rd Street, New York 16, New York; 1949. Price \$3.00.

With a little encouragement, a fragment of wilderness may be lured to back yards in towns, suburbs, and cities. Bird boxes, a conscientiously tended feeding station, and judiciously selected shrubbery will attract birds which most town dwellers see only in fields and woods. Bird study of this kind may be undertaken by people of any age and physical condition. The financial outlay is negligible since all that is needed are a few boards hammered together to make houses and feeding shelters, table scraps, and an illustrated bird guide. Among the essential items, however, should be included this new book by Ted Pettit. It contains full instructions for those who would get the most out of this inexpensive and entertaining hobby.

Full instructions on how to attract various groups of birds are given, and plants which will attract shy species from miles around are listed. For those who wish to go a step further, there are detailed instructions on obtaining photographic close-ups of birds without benefit of expensive telephoto equipment. Bird students already interested in attracting birds to their homes will find many valuable tips between the

pages of this volume; those who wish to s a fascinating hobby which requires li cash, experience, and less time than t will wish to spend will find it invaluable

## BIRDS OVER AMERICA

By Roger Troy Peterson

342 xiii pages. Illustrated with 80 pages photographs by the author. Published Dodd, Mead, and Company, 432 Fou Avenue, New York 16, New York. P \$6.00.

Most noted for his justly much-pra Field Guides, Roger Troy Peterson in pages of this book proves that he knows art of writing as well as those of ornitho and painting. This volume tells the en taining, interesting and informative st of the wanderings and adventures of one America's greatest living ornithologists. Peterson's travels in a quarter-century bird study have carried him the length breadth of the American continent, preserved within the pages of his book the highlights of his studies.

The photographs, all taken by the aut and many of which are reproduced for first time, are magnificent. In a "Photographic Postscript" the author states: "The important thing to me is not simply record a bird on film, but to be an ar about it." A glance at any of the 80 pages of photographic art in this book show how well he has succeeded in his a

This volume will enable the reader view his country through the eyes of its master ornithologists. For any who enjoys the study of nature its p offer an unparalleled vantage point.

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Ornithologists have found t birds sing an average of 18 $\frac{1}{4}$  ho daily most of the year.

\* \* \*

The smallest known insect is a t wasp about one ten thousandth size of the common housefly. Yet is equipped with six articulated le complete nervous, respiratory a blood systems, and compound e composed of hundreds of face lenses.

\* \* \*

The long bristly hairs surrounding the nostrils of seals act as instruments of touch and are useful in ploring the underwater crevices icebergs that may shelter fish.



### Bruin Gets the Blame

**DU BOIS**, Clearfield Co.—On April 1, 1952, I received a call from Deputy Game Protector Byers of Du Bois, Penna., stating that a bear had killed five small pigs. Investigating this complaint the following day with Deputies Ishman and Byers, we were not able to find any bear signs or around the pen, but did find hair inside the pen that we believed came from a collie dog. While talking with the lady of the house, we learned that they had a large collie dog, but had killed it that morning. After locating this dog I performed an autopsy on it and found that the stomach contained parts of one of the pigs. After showing the hair and part of the contents of the stomach to the lady of the house, she was convinced that the dog, not a bear, had killed the pigs. District Game Protector Michael Grabany, Houtzdale.

### Carnivorous Deer?

**WEXFORD**—Several days after the close of the 1951 deer season I was instructed to investigate a hunter's

report that the doe deer he had bagged was diseased. The hunter had noticed when dressing the animal that the one lung was not normal—it had ceased functioning and was smaller in size than a man's fist. A thorough examination revealed that two small bones and a bone fragment had been lodged at the division of the bronchial tubes. The irritation and inflammation set up by these foreign bodies had subsequently shut off the air supply to this lung and the lung deteriorated. Project Leader Glenn L. Bowers, Wexford.

### Black Far From Home

**CAMP HILL**, Cumberland Co.—On Sunday afternoon, April 6, I received a telephone call to the effect that a black squirrel was jumping from limb to limb in a tree near 32nd Street and Bramar Road, Camp Hill. Going to the spot immediately I saw it was a black squirrel for sure, an unusual color phase in this part of the state. None of the neighbors observing the animal knew where he came from. Wilbur M. Cramer, Assistant Executive Director, Harrisburg.

### Fox and Fawn

**MARIENVILLE** — While talking with one of the men from the lumber camp at Guitonville, he told me that while in the woods this summer, he heard a kind of yipping sound and saw a fawn deer come running towards him that was being chased by a gray fox. This is the first time I have ever heard of a gray fox trying to kill a fawn, although I have heard it said that a red fox will kill a fawn.—Game Protector George W. Miller, Marienville.





### Bears On the Increase

LEWISTOWN, Mifflin Co.—From all indications, we are having a migration of bear into Mifflin County. During the past month, I have investigated five complaints of bear damage to beehives and corn cribs. On May 31, at about 11:00 P. M., I received a call from Deputy Keister at Lewistown, R. D. 1, that a bear was in a tree in front of his home. Upon arriving at his home, I found a large crowd of people, with lights and flash cameras, taking pictures of a fair sized bear in a large pine tree about thirty feet from his front porch. After the crowd was moved back from the tree and the light put out, Mr. Bruin finally came down on the ground. He paused and looked the crowd over, then trotted away into the woods. District Game Protector George B. Smith, Lewistown.

### Whatzit?

APOLLO, Armstrong Co.—Report came to this office that while rowing a boat on Crooked Creek State Park, the owner saw something swimming up to the boat. He picked the animal out of the water and took it to a local service station. The man did not know what he had and the gas station proprietor informed him that

it was a baby mink. They took back, and the baby mink took again. District Game Protector H. Greenwald, Apollo.

### Dry Land Ducks

BRADFORD COUNTY—While working on State Game Lands No. 123 in Bradford County, we flushed a female mallard from her nest which contained, at the time, ten eggs. The part that was interesting to me was the fact that she had made her nest over a mile from the nearest water which was a beaver dam. She had her nest concealed in high grass and would be impossible to see unless care would be taken while walking through the patch of grass or it would easily be stepped on.—District Game Protector Clyde E. Laubach, Elizabethtown.

### Prickly Pet

YOUNGSVILLE—One of the oddest pets that I have ever run across is a pet Porcupine owned by a resident of Irvine. This porcupine was caught when it was just a wretched mite and was raised on a bottle until it was old enough to eat by itself. The owner said that when it was real small, it was necessary to feed it with an eye dropper. Its present weight is better than twelve pounds. You can handle it and play with it just like a kitten. The owner had me pick it up by the tail but it took considerable persuading for me to do it. It will place it on his shoulder and turn over to his face and muzzle him. I have seen all kinds of pets but this one wins the prize.—Game Protector William R. Overturf, Youngsville.

### Bountiful But Dumb

BLAIN, Perry Co.—Opossums are on the increase. Most any day you can see from four to six lying along the highways in the district, they were victims of cars the previous night. District Game Protector Harold E. Russell, Blain.

**Fawns and Farming Don't Mix**

HARMONYVILLE, Chester Co.—While plowing in a weedy field on his farm, Melvin Zook of Harmonyville, heard a squealing sound and looked down to observe a young fawn peer just in front of the big wheel of his tractor. After stopping the tractor and chasing the fawn into the woods nearby, he discovered the twin had been almost completely plowed under and smothered. This makes the second fawn that has been accidentally killed on this farm in the past two years. District Game Protector Ralph L. Shank, Uwchland.

**Albino Fox**

NEW CASTLE, Lawrence Co.—While checking fox traps the other day near a fox den I found the remains of a pure white fox pup which had evidently been killed by the rest of the members of the family. District Game Protector Calvin A. Cooper, Jr., New Castle.

**Flying 'Coon?**

FRANKLIN, Venango Co.—In my absence a few days ago the Franklin Fire Department called for me about a raccoon. I returned about two hours later just as it was being released. It had fallen or climbed down



a chimney of a restaurant here in the city, a two story brick building in a block with other brick buildings. How it got up on the roof of this building is a mystery. The firemen spent about an hour with ropes and hooks to fish it out of the chimney. District Game Protector Clyde W. Decker, Franklin.

**Whitetail Quads**

WESTFIELD, Tioga Co.—Deputy Game Protector Willoughby, of Westfield, R. D., states that while plowing a field on his farm, he has seen a doe deer several times and each time this deer has had four fawns accompanying her. Quite a sizeable family. District Game Protector Gerald W. Cyphert, Westfield.

**Slim Pickin'**

BROOKVILLE, Jefferson Co.—The deer on Game Lands 54 are in very poor condition this spring; some of the late fawns from last summer won't weigh over 25 or 30 pounds, and they seem to be feeding about 24 hours a day in order to survive. District Game Protector Lester J. Haney, Brookville.

**Turning the Tables on Tabby**

ERIE, Erie Co.—It has been reported that at two different fox dens two freshly killed house cats have been found, along with the usual amount of rabbits and ringnecks. District Game Protector Clifford L. Ruth, Erie.

**Late Shedder**

BRYN ATHYN, Montgomery Co.—On the evening of April 4, 1952, I was called to the vicinity of Bryn Athyn to pick up a deer killed by a car. This was a buck and weighed 200 pounds and I was rather surprised to find the animal still carrying a beautiful eight-point rack. District Game Protector Donald L. Croft, Horsham.



By Thomas A. Forbes

## PART II

*Follow the String:* A bow that has taken a permanent set in the drawing direction.

*Floo Floo:* An arrow used in wing shooting. It is generally fletched with large feathers in a one-quarter to a complete spiral. The design of the fletching is such that the flight distance is short.

*Footing:* A hardwood splice at the pyle end of a wooden shafted arrow.

*Gold:* The bull's-eye in the regulation target. A circle  $9\frac{3}{5}$ " in diameter.

*Green:* Shooting Range.

*Grip:* The part of the bow held in the shooting hand.

*Hen Feathers:* The two feathers, generally of the same color, which are not at a right angle to the nock.

*High Braced:* When the fistmele distance exceeds (7) seven inches. It is better to high brace a bow than to low brace one.

*Hold:* The pause at the full draw position prior to release of the arrow.

*Home:* When the arrow is fully drawn with the pyle even with the back of the bow it is home.

*Horns:* Tips of the bow made from animal horns in which the bow string nock is cut.

*Jointed Bow:* Same as a carriage bow.

*Kick:* A jar which is felt when a bow is shot. Due to unevenly tillered bow limbs.

*Lady Paramount:* A lady assistant to the field captain. In charge of the womens' shooting line in a tournament.

*Laminated Bow:* A bow that is built up in layers; either of different kinds of wood or a combination of

# A Glossary of Archery Terms

wood and metal or other materials.

*Limb:* Half of the bow from the handle or grip to the tip. i.e., upper and lower limbs.

*Loose:* The act of shooting. Letting the draw bow string slip from the shooting fingers.

*National Archery Association (NAA):* Larry Briggs, Secretary, Treasurer, Amherst, Mass.

*National Field Archery Association (NFAA):* P. O. Box 388, Redlands, California.

*Nocks:* The grooves at the tips of the limbs of the bow into which the bow string is fitted; also the slot at the feathered end of the arrow.

*Nocking Point:* The point on the bow string where the arrow nock rests.

*Overbowed:* A bow with a drawing weight in excess of that which the archer can shoot properly.

*Overdraw:* To draw the bow beyond the arrow length for which the bow is designed.

*Overstrung:* When the fistmele exceeded by the use of too short bow string.

*Pair:* Two arrows and a spare; also three feathers.

*Pennant:* A small flag with the fly longer than the hoist. Placed at the line of targets on a staff to indicate the direction and velocity of the wind at the targets.

*Pennsylvania State Archery Association (PSAA):* P. O. Box 129, Lancaster, Pennsylvania.

*Petticoat:* The border outside the last or white ring of the target. It has no scoring value.

*Pyle:* The metal tip attached to the head of the arrow shaft; the point

**the arrow.** Anglo-Saxon (pil) meaning dart; also spelled pile.

**Pin:** A very small knot in bowoods, especially yew or osage.

**Pinch:** To crush the fibres of the bow by compression. See Chrysal.

**Pin Hole:** The center of the gold of the target, i.e. dead center

**Point Blank:** The distance to the target that a given bow will shoot an arrow with a flat trajectory.

**Point of Aim:** An object at which the archer aims by sighting over the arrow point.

**Quiver:** A container for arrows. Shape size, and materials vary. They may be carried at the waist or on the back between the shoulder blades.

**Quiver, Ground:** In the simplest form, a metal rod with a loop at right angles. Inserted in the ground arrows may be dropped through the loop and withdrawn one at a time by the archer on the shooting line.

**Recurved Bow:** A bow that is bent back from a straight line at the ends of the limbs.

**Reflexed Bow:** Unstrung and held in a shooting position the limbs of the bow curve away from the archer.

**Release:** Same as Loose.

**Round:** A fixed number of shots at a given distance or set of distances.

**Rover:** An archer who engages in field shooting. See Roving.

**Roving:** Shooting over fields and woodlands at natural targets.

**Run:** When a single one of the strands which make up a bow string raps, stretches, or breaks, the string said to have a run.

**Sap Wood:** The wood immediately underneath the bark.

**Self:** Used in reference to a bow or arrow made from a single piece of wood; i.e., self bow, self arrow.

**Serving:** The winding or wrapping round the bow string at the nocking points to protect the bow string from wear.

**Shaft:** The body or main section of the arrow. The term "feathered shaft" is frequently used in print to designate an arrow.

**Shaftment:** That section of the shaft to which the feathers are attached.

**Shake:** A longitudinal crack in a bow stave.

**Shooting Glove:** A three fingered glove used to protect the shooting fingers.

**Shooting Tab:** A flat piece of leather designed to be worn on the shooting fingers for protection.

**Spine:** The inherent quality in the shaft of the arrow that permits it to bend around the bow as it starts its flight to the target.

**Stacked Bow:** A bow with an oval cross section. One in which the thickness of the limbs is a little greater than the width.

**Steele:** Same as shaft.

**Tab:** See Shooting Tab.

**Tackle:** The equipment of an archer, including bow, arrows, quiver, shooting glove, bow strings etc.

**Tiller:** Shaping the bow to proper curvature.

**Toxophilite:** One fond of, or devoted to, archery. Derived from the Greek *toxon* meaning bow and *philos* meaning loving.

**Turn:** A term used to describe a bow that has a twist to right or left of the string.

**Underbowed:** A bow having too little drawing weight for the archer.

**Undershoot:** To shoot below the target.

**Upshot:** The last shot in an archery contest.

**Vane:** The web or flat expanded part of a feather. On flight arrows the flat extended surfaces attached to the shaft to serve as fletching.

**Wand:** A wooden stick two inches in width, standing upright in the ground, with a height of six feet. Used as a mark at which to shoot.

**Weight:** See Drawing weight; also the weight in gains of an arrow.

**Whip Ended:** A bow which has limbs that are too weak at the tips.

**Whipping:** See Serving.  
 . . . The End.



Photo by the Author

*Using the most logical approach, these female delegates to the Izaak Walton League Convention, in Tulsa, put across their conservation message with the aid of cleverly designed chapeaus.*

## Ladies' Day at Tulsa

By Grace O. Beach

THE ladies took the spotlight and had the men bug-eyed with curiosity at the Izaak Walton League Convention at Tulsa, Oklahoma in May.

It was the third day of the convention and for the fourth consecutive year, a luncheon for the ladies was scheduled. It would be safe

to say that every man lost complete control of the lower jaw at the sight of a contingent of ladies strolling down the corridor toward the Ivory Room where the luncheon was being held.

Those ladies were wearing the most unusual hats (even for women) any man ever beheld. There they were, a bevy of Oklahoma lady delegates wearing snappy, beautiful, dandy green pillbox type hats with a white oil derrick perched on top.

When we recovered sufficient from our surprise to ask questions we learned these hats were repre-



itative of their state, "The Oil Capital of the World."

Immediately following them were ladies wearing large brimmed cowboy hats, brims laced with colorful leather thongs and with thongs tied under the chin.

This was only the beginning, for sorts of hats decorated in the most unusual and elaborate fashion began appearing as more and more ladies assembled for the luncheon. By this time, men lined the corridors and buzzed in excited wonder as the ladies paraded by.

Their curiosity reached its peak, when a number of ladies carrying large hat boxes appeared in the corridor and were lined up, given instructions and shepherded into an ante-room. It was evident that they wanted to see the show, too, but they were not even allowed a peek into the boxes. This was a ladies' Indig and men were not allowed. When the doors swung shut, closing out any further curious peeking on the part of the men.

As the excitement died down a little and the luncheon was served, our attention was diverted to the table setting. There were flowers, and small Indian dolls made on clothespins, full skirted and shawled, with long dark braids hanging over the shoulders. Cleverly decorated faces made them a treasured souvenir to take home. There was also, a pair of whimsical ceramic salt and pepper shakers in the shape of Indian Tees, another gift for each guest.

The food was delicious and for a time every one applied themselves to the business of eating and chatting. When the gavel sounded and the room grew quiet with anticipation.

The Chairman, Mrs. Ural A. Ross, President of the Stillwater Women's Chapter of Tulsa, Oklahoma, hostess at the luncheon, welcomed the guests and announced that the features of the luncheon were—"Hats, Husbands and Howdy." Her part was the

"Howdy" and the "Husband" feature would be found by our plates in the form of a folder. The folder was round in shape and on the top it announced that "Husbands are like Resources." As the folds were opened they formed a six petal flower, and on each side of each petal was a cartoon and explanatory words following a conservation theme. In the order in which they appeared as unfolded they were—*Sometimes deforested* (baldheaded man); *Polluted* (bleary eyed gentleman); *Eroded* (worried, wrinkled man); *Unwisely Diverted* (man eyeing feminine charms); *Wasted* (man with large midriff); *Overworked* (man at hard labor); *Exploited* (man with empty pockets turned inside out); *Abused* (man with rolling pin sailing at his head); *Submerged* (man surrounded by bills and taxes); *Burned* (man with ladies high-ticketed hat); *Neglected* (man with toes out of socks), then on the last flap it stated that "Like resources, husbands are more useful and enjoyable if conserved." It was very clever and tied in well with the whole picture.

The chairman then introduced Miss Bette Fry, President of the "Ding" Darling Women's Chapter of Des Moines, Iowa.

In her introduction Miss Fry said: "In the Spring 'tis said, a young man's fancy lightly turns to thoughts of love. A woman's fancy wouldn't lightly turn away from love, but she could, just possibly you know, have her head turned by a new hat! The Ding Darling Chapter of Des Moines, has capitalized on this strongly feminine trait, and for your critical inspection and we hope, approval, we present, not men, but millinery! Not only have we created new models—we have turned our creative talents to the purposes of our presence here in Tulsa at this Izaak Walton League convention, to illustrate the conservation of soil, waters, woods and wildlife. Ladies, we present your Conservation Hat Parade!"

Here a model entered wearing a hat trimmed with evergreens, built up around the crown like a wooded hill, as you will note from the picture of the conservation hats, reading from left to right. Miss Frye, went on describing the hat and her presentation was so clever we reprint it here as given by her:

"Here is a specialty hat we have called FIRE PREVENTION. It's the kind of hat you first pass over, and then go back to buy. It sort of 'grows on you.' Its basic appeal and desirability do something to you. The designer, Mah-dahn Nature, subtly suggests an idea which appeals to you more each time you see it.

"Note the predominance of green in this creation—a color note of the season—and a color used delightfully year after year by this designer, as a matter of fact. This verdant green forest could be quickly reduced to nothing, just nothing, by a carelessly tossed cigarette butt. Every year it happens to many thousands of acres of forest and grass lands. The model wears this spring creation to remind her friends to be sure to put out the fire before discarding old flames. As she continues to move among the tables to give you a close view of the hat, we have another model.

"This one is wearing a daring creation called GAME CONSERVATION. This number is a hunter's dream. The object is to keep the game *before* the hunter. But, to keep the game before the hunter, we must conserve each year for next year's shooting. The secondary motif is important, as I'm sure you will see. A few nut trees, berry bushes and shrubs keep our furred and feathered friends well fed and housed.

"The splash of red on the hat is a reminder that all that moves is not necessarily game. It is a warning to stop, look and listen, to be sure your gun is pointed at a fair and legal target.

"There is always a question whether women buy their hats to

please men, or to be envied by other women. This hat was designed to be of particular interest to men, as our model tells us we'd better warn you, women, when you wear this hat men may forget to check whether 'open' season." (This hat had miniature ducks, rabbits and birds perched among the shrubs, nut trees, and berry bushes that decorated the lovely straw bonnet.)

At this point, another model came through the door wearing a large black picture hat. Around the crown was draped a beautiful big red fur scarf, with the tail draped over the shoulder.

The narrator went on—"Now here is a ravishing number called PREDATORY ANIMALS. We invite this one to dress up your suits, complete your glamor costumes.

"Having selected this name before the hat was made up, we cautioned the designer that it must be sleek, graceful, lithe and smart. That she succeeded is not doubted the least at this moment. One look at it and the elevator operator missed our stop by three floors. (It was really stunning).

"This lovely model is quite familiar with the necessity of 'control' which, after all, was one purpose of Mother Nature when she created predatory animals. She uses them to keep the numbers of all her wild life in check in areas where we humans haven't taken over.

"By some 'quirk' we seemed to find the 'pursued' animals desirable. Consequently, our harvest of them now seem to upset the balance. Then, it is our custom to try to rectify, taking out of circulation a commensurate number of the natural predators. There generally is no closing season on them. Despite this, predators seem to survive . . . at least the wolf call is still heard over the land.

"In seeking to control predators man actually goes too far sometimes. As an example, a group in Colorado

pt on a drive to kill off coyotes several years ago, and, before long, the jack rabbits were taking over the place. Old Ma Nature knew best. 'Now we come to a creation we've considered 'copyrighting.' Here is the WATER POLLUTION hat.

"I'm told the way to measure a hat's success is to count the number of people who turn around to look at it. Believe me, everybody turns around to look at this one. It's a simple creation, as many of our best sellers are. An imaginary stream running around the brim (by the aid of mirrors) may once have been sweet, pure and clean, but the trickle from those chic little 'Chick Sales' perched on the crown, adds nothing beneficial to the water below.

"This number reminds us that whenever any of us—individuals, corporations, or cities pollute any body of water, we're appropriating for our own use something that belongs to all the people. We're falling short of being good citizens. As the Blue Spruce Girls out in Denver say—'our responsibility for the water you use doesn't end when you put it down the drain.' This model is an effective reminder of our responsibilities in this regard.

"Now as a practical hat, we suggest our MULTIFLORA ROSE worn by our next model. Note the fencing, which multiflora uniquely does while living. Other fencing is, of course, quite dead before serving its purpose. Can't you imagine how wonderful a nesting place this makes for the birds? It will provide emergency food for them, too. Steady, I didn't say this hat was strictly for the birds. Multiflora goes well in a good many parts of the country, as just a hat to be really practical. The multiflora grows fast, and is long lasting. Owners of this shrub, or the hat of the same name, will be proud for many years of their bargain.

"And now a man-made bonnet (the man being Bob Loebe of Des

Moines)—The SOIL CONSERVATION hat. It is quite appropriate that this hat should be created by a male designer. The problem it seeks to point up is largely a 'man-made' one. Not that we're trying to start a 'battle of the sexes' when we say 'man-made'—we use the term in its inclusive sense, to mean all mankind.

"In driving about the countryside, we see many evidences that we haven't been so smart. The soil from which we draw our existence is being allowed to wash away. If you don't want water cutting gullies in your lands, do as Loebe has done in this hat. Grass the waterways, contour plow, and plant beneficial vegetation to reclothe Nature and save her soil. Wear this hat all year long. It isn't a seasonal 'job.' It's basic and has its place throughout every month. (The description fits the hat perfectly.)

"Our next hat is a sentimental creation—the GOLDFINCH AND WILD ROSE. We from Iowa love this little number, not because it has conservation value, but because the goldfinch and wild rose are our state bird and flower. The lines of this hat are quite pronounced, as are often our sentiments about our home state. We are proud of the place Iowa has in the scheme of things, and the fact that we're aware of the importance of our basic resource of soil is evidenced by a statewide and imposing membership in one of the soundest of conservation groups, our own Izaak Walton League. In the female version of 'Tipping the hat' the model donned this hat in tribute to the State of Iowa and the largest State Division in the League.

"Coming on now is our WATERFOWL HAT—our 'continental' masterpiece." (It was just that, too, a large straw trimmed with cat-o-nine tails, reeds and grasses, with a feathered miniature Mallard duck flying out from the reeds and on

the crown a nesting duck. It was a beautiful creation and attracted a great deal of attention.)

When Miss Frye could be heard above the Oh's and Ah's, she went on. "Truly continental by nature, waterfowl nest in the north even in the polar regions, and then sweep the length of the continent to winter in the deep South, near the Gulf of Mexico, or even old Mexico. The waterfowl which this creation symbolizes is a specialized creature. It cannot utilize just any type of countryside it traverses in its annual migration. It requires particular and specific kinds of resting, nesting and feeding habitat, and man and his civilization in this country--through unwise drainage, and in other ways--are taking even more of the waterfowl's required environment. It's a 'ducky' little number as I'm sure you'll agree. We consider it symbolic of the fact that we must not let the days of the waterfowl on this continent be numbered. May we never see 'extinct' written across the pages of books that picture the species you depict.

"And now, the gal who has been holding the mirror for the other models and who is due a great deal of credit for the 'creative' art you've just seen, our own Maurine Stanton of Des Moines who models the FISHING HAT. Into every hat wardrobe must fall one 'fling' and as the final presentation from our collection, we give you a hat 'just for kicks.' Not all members of the Izaak

Walton League are fishermen, many of them are, and those who are, usually are ardent fisherman. Women, who wear this hat undoubtedly will enjoy 101 per cent popularity rating with their husbands and would-be husbands. This fish woman's hat complete with fishing pole and bait--bait that's You single girls should remember this spring number. If you're smart you can use it to turn your young man's fancy to thoughts of love. That seems to be where I came in and ends our hat parade."

We are grateful to Betty and Maurine, for the script so that might be reprinted for the enjoyment of our readers. We congratulate Maurine for her clever idea, vividly carrying out the conservation theme which drove it home so forcibly in such a clever fashion.

The whole show was so clever that it made the papers and television hats and all.

The men stole a march on ladies, though, for when they learned it was to be televised, they moved fast. A television set was brought in and set up in one of the parlors just in time for the show. When we peeked in the door, the men were all sitting tailor fashion on the floor watching the ladies on TV. There was no room for ladies in the parlor so we closed the door and tiptoed away to let the men have their fun. After all we saw the originals.

. . . The End

Beavers always cut their winter supply of wood in good season. As early cutting generally means an early winter.

\* \* \*

A bird's feet are so constructed that the foot is forcibly closed when the leg is bent. Hence birds maintain a steady grip on limbs or perches even when asleep.

The eagle never makes use of his beak in killing his prey. Larger birds are dispatched by the stroke of the eagle's dive, smaller ones are killed by the grip of its talons.

\* \* \*

Although the mole lives underground its soft fur is so constructed that no earthy stain defiles its glossy smoothness.



By Herbert Kendrick

**T**O BE reasonably assured of future days in the field with the valuable companionship of a graceful, well mannered, dependable gun dog, extreme care should be exercised in the accurate selection of a pup. Superior dog performance is neither accident nor luck but is the result of proper breeding, correct training, healthful food and housing, plus a sincere love for his master.

A dog that carries himself attractively with a smooth easy stride, high noble head, and merry tail, is truly

thing of beauty in woods and fields, and such an animal is well worth the money, time and effort required for his selection and training through the one to two years that make up his puppyhood. This period of time can be as sporting and thrilling as the actual killing of game over the finished dog. The joy of accomplishment through each phase of his training is forever lasting, and will be well remembered long after his days of usefulness have passed.

The choice of a puppy should not be as uncertain a risk as many prospective dog owners are led to believe. Provided a few simple qualifications are kept in mind, and the buyer does not act too hastily, then his chances are more than fair that his beginning will be successful.

The first and most important of these qualifications is that of breeding. Go into the field with the parents of the pup and actually see them perform. Carefully study movements, style, nose and attitude toward each other, then watch their use of reasoning and methods of out-

## *Choosing a Puppy*

witting the crafty game birds they seek. Consider their field etiquette, their admiration for the handler. If response to command, and observe the sire and dam possess the qualifications you desire, you may rest assured the pups have inherited some fine characteristics from the parents.

Under no circumstance should a hunter buy a puppy that is not entitled to be registered, for as sure as he will develop into a prized possession, you will desire him to produce a prodigy for yourself or your friends who know the value of good bird dogs. It costs no more to keep a well bred dog, while the confidence and pride in ownership is worth far more than the difference in the original cost.

Pointers and setters are the most often used for hunting game birds in this state. The Griffon, Brittany Spaniel, German Shorthair, Cocker and Springer Spaniel are gaining in popularity but the majority of gunners still rely upon the pointer or setter. There are many experienced dog men who rely heavily on the setter, and give substantial reasons for their choice, yet on the other hand the enthusiastic pointer fancier will give identical reasons for his confidence in the smooth short-haired dog. The choice of any type of bird dog should be your own personal preference.

Where there are a number of puppies in the litter of the parents you have selected, choose the youngster that boldly holds up his head, uses his tail with merry ease, and looks at you with clear unafraid eyes, then makes an effort to be friendly

with you. Avoid the nervous, sickly one because he will cause you no end of trouble. Look for the little feller that seems glad to be alive, happy contented, willing and active.

Do not underestimate sentiment because it comprises more than fifty percent of the sport of hunting. Take a dog you love deeply and a great part of your training problems are solved. If he is certain of your affection he will exert himself in his efforts to please you and you will have more than a field performer, you will possess a rare hunting companion. Volumes have been beautifully written about the love of a man for his dog and the love of a dog for his master. Therefore, do not overlook the quality of affection.

Use your own judgment as to the selection of sex. Here again one man desires a male and others feel that the female is easier to train, possesses a keener nose, and develops into a smarter and more biddable performer. Just remember that if you select a bitch she may be in season during the open hunting season and

although many females have been successfully spayed, it is not a completely satisfactory procedure, as it is in direct interference with the natural function of the dog's organs. Spaying may make the bitch dull and listless, therefore destroying her desire to hunt.

No matter what color combination you select be sure your puppy can be easily seen in cover. This effect can be achieved if the greater part of his body is white. This does not mean that spots and body markings are undesirable, for distinctive markings, smooth and even, make a dog a thing of beauty.

Try to select a puppy of medium size, one which promises to develop enough bone and muscle to penetrate heavy cover without discomfort and at the same time be small enough to handle himself gracefully and easily.

Select a puppy with all these qualifications and in him you will have found a youngster which will respond to training, and will develop into a pleasant field performer.

. . . *The End.*

### STANDARD LOADS

(High Velocity Loads 10% Greater)

#### *Size of Shot*

Shot No.	Diam.	No. in Oz.
12	.05	2.835
9	.08	.585
8	.09	.410
7½	.095	.350
6	.11	.225
5	.12	.170
4	.13	.135
2	.15	.090
BB	.18	.050

#### *Effective Range of Shot*

Energy	Rem. Vel.	Range Yds.
.64	600	34
.81	580	40
.90	560	44
1.21	520	55
1.44	500	64
1.69	480	74
2.25	440	97
3.24	400	125

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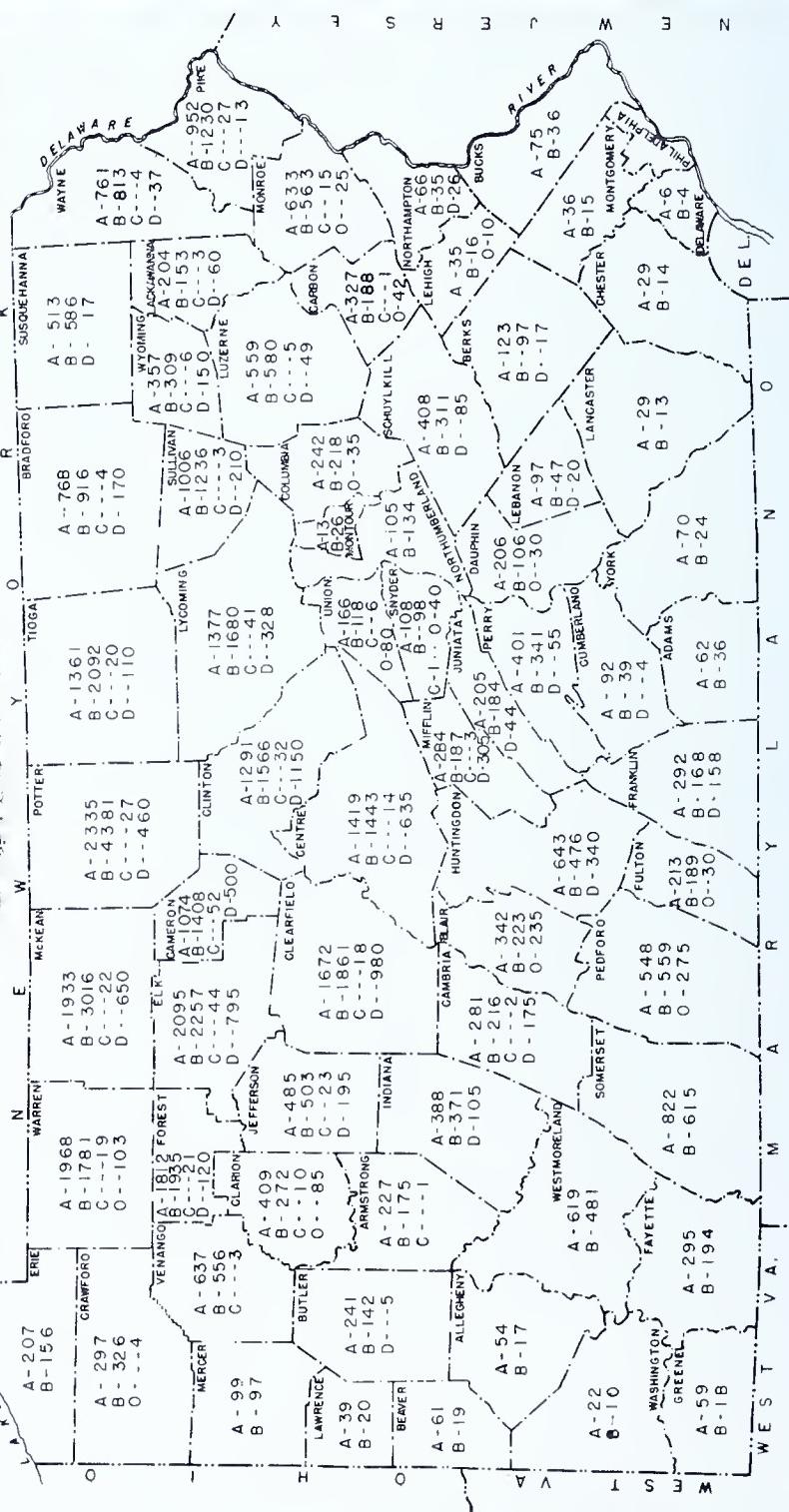
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1951-DEER, BEAR & TURKEY KILL  
PENNSYLVANIA GAME COMMISSION

HARRISBURG, PA.



TOTAL - LEGAL ANTLERED BUCK DEER KILL - 34,582  
 TOTAL - LEGAL ANTLERLESS DEER KILL - 37,952  
 GRAND TOTAL - 72,534

A - COUNTY UNKNOWN-27 (Included in total.)

**KEY**  
A - LEGAL ANTLERED BUCK DEER.  
B - LEGAL ANTLERLESS DEER.

PENNSYLVANIA

# Game News

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# THE STORY BEHIND THE COVER

Possibly only a duck hunter or a bird lover would thrill to the contented quacking of a flock of ducks in a mist covered marsh or tremble as rustling wings and strident calls take them aloft in sudden alarm. But there are a good many duck hunters and bird lovers who will be interested to learn what is being done to increase the waterfowl population in Pennsylvania.

While Pennsylvania may not have as many ducks as some states, it does have numerous marshes, rivers, lakes and ponds where ducks, geese and other waterfowl rest and feed during migration. Some stay to nest, including the wood duck which was so scarce a few years ago. This beautiful duck has steadily increased through careful Federal and State protection and because convenient nesting boxes have been erected for these birds.

The Game Commission has put up thousands of nesting boxes and encouraged sportsmen to erect them too. It has built many impoundments on Game Lands to attract waterfowl and planted aquatic vegetation in and around them to provide food for hungry visitors. In the past several years it has raised, leg-banded and released thousands of ducklings on secluded ponds and other water courses. Farmers have been encouraged to establish reservoirs and these multiple-use impoundments have, in many instances, become havens for ducks and geese.

Yes, much is being done to help restore our waterfowl, but much more can be accomplished if everybody helps.

# PENNSYLVANIA *Game News*

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by the

Pennsylvania Game Commission

Commonwealth of Pennsylvania

JOHN S. FINE, GOVERNOR

★

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★

Cover Painting  
(Mallard Duck)  
by  
Ned Smith

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## *Editorial*

**V**ACATIONS are over, Labor Day has come and gone, and the kids are back in school refreshed from a summer in the out-of-doors.

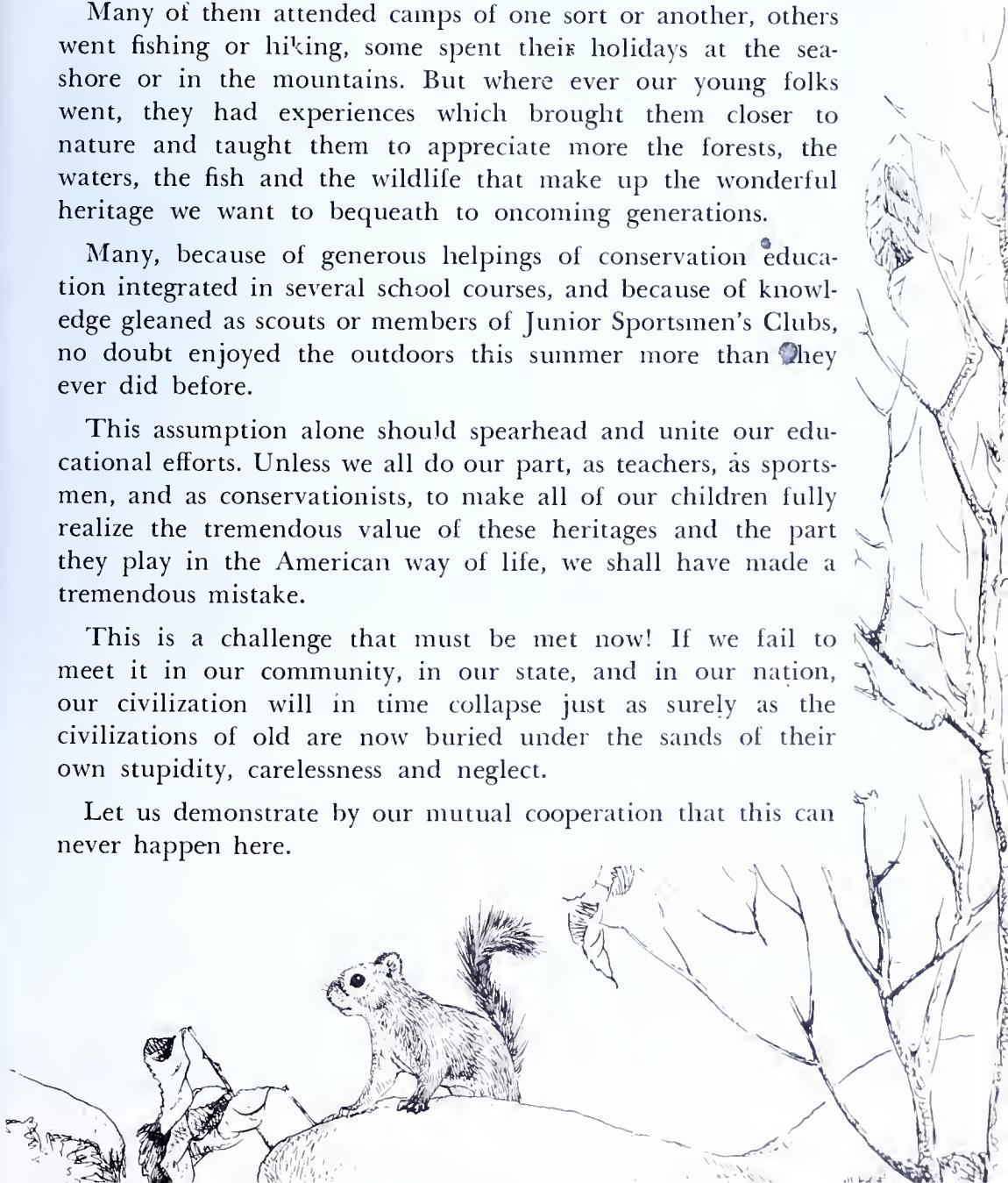
Many of them attended camps of one sort or another, others went fishing or hiking, some spent their holidays at the seashore or in the mountains. But where ever our young folks went, they had experiences which brought them closer to nature and taught them to appreciate more the forests, the waters, the fish and the wildlife that make up the wonderful heritage we want to bequeath to oncoming generations.

Many, because of generous helpings of conservation education integrated in several school courses, and because of knowledge gleaned as scouts or members of Junior Sportsmen's Clubs, no doubt enjoyed the outdoors this summer more than they ever did before.

This assumption alone should spearhead and unite our educational efforts. Unless we all do our part, as teachers, as sportsmen, and as conservationists, to make all of our children fully realize the tremendous value of these heritages and the part they play in the American way of life, we shall have made a tremendous mistake.

This is a challenge that must be met now! If we fail to meet it in our community, in our state, and in our nation, our civilization will in time collapse just as surely as the civilizations of old are now buried under the sands of their own stupidity, carelessness and neglect.

Let us demonstrate by our mutual cooperation that this can never happen here.





By J. Q. Creveling, Esq.

*Mr. Creveling, a former member of the Game Commission who was much interested in State Game Lands, is still hale and hearty on his way to his 91st birthday.*

IN THE September 1950 issue of the PENNSYLVANIA GAME NEWS, there were two separate articles that deserve a great deal of consideration. One of those articles was written by Mr. Bill Wolf—"The Day Public Hunting Ended" (referring to the year 2050); and the other article was written by Hon. Ross L. Leffler—"Teachers and Conservation" (referring principally to the need of conservation of natural resources in order to preserve the Commonwealth). The reading of those two articles should create a profound impression, not alone upon the reader, for the time being, but an impression that the reader should be able to pass on to non-readers, and in the end to promote action that might result in the conservation of our natural resources, and the preservation of public hunting, so that the consequential fatal day of the prophecy of Bill Wolf may be forever postponed.

The conservation of our natural resources goes to the very life and subsistence of our present people and of millions yet to come, and the perpetuation of public hunting goes to the conservation of a natural resource, that is, our wild animal life, so as to yield an annual hunting surplus, a resource which is necessary, enjoyable and valuable.

The gist of Bill Wolf's article is that public hunting may cease by the year 2050—one hundred years from now, unless sufficient is done to prevent it, and the gist of Mr. Leffler's article is that conservation is dependent upon the education of the masses of our people, that it is essential to the perpetuation of the Commonwealth, and in the ways in which conservation is to be accomplished, there must be widespread activity. Both articles point out the necessity for action, but neither article suggests the particular methods of action,



Penna. Game Comm. Photo

The main causes for no trespass signs are vandalism, over-killing of game, and un-sportsman-like conduct. These causes can all be eliminated if the farmer, the sportsman and the Game Commission cooperate.

but presents rather a general view of the subject and the urgent necessity for action, to be begun now and to be continued constantly.

By proper attention to the subject, I believe it will be possible, as time unfolds between the present and the year 2050 fixed by Mr. Wolf as the date for dissolving the game commission, on which Mr. Leffler is now a member, to set up plans and specifications, and to blueprint them for use and operation, so as to avoid the catastrophe mentioned by Mr. Wolf, and accomplish the hopes of Mr. Leffler, thus saving the Commonwealth, and perpetuating public hunting.

Both articles strongly imply that the preparation of the blueprint should be not only the work of the sportsmen, but should receive the cooperation of all the people interested in the preservation and general welfare of our Commonwealth. Much will depend upon the sportsmen, if their sport is to be preserved, and much will depend upon the whole people, if the Commonwealth is to be kept as a land of plenty, avoiding the mistakes of barren, decadent countries where people can now scarcely live.

Well, there we have the matter stated. What are we going to do about it? Will we stand aside, and merely wait till the year 2050, and hear Bill Wolf and his descendants say "I told you so" or will we buckle down to it and show Bill Wolf and his descendants that the people of Pennsylvania have the grit and enterprise to avoid the day of dissolution or destruction, and that he did well to base his prophecy upon the word "unless . . ."

I am taken back in memory to about the year 1895. A number of the sportsmen foresaw, as in a vision, the evil day approaching when hunting would be no more, because game would be no more, and in truth it then looked near at hand. We were told then that it was foolish to think

of Pennsylvania as a game state, being a manufacturing state. However, after considerable effort, and not to disappoint those "visionaries" the legislature appropriated a very small sum of money, and appointed a Game Commission. What has happened since? A great deal has happened. Then it was doubtful that there were five hundred deer in the whole state. Now we have nearly a million, in fact too many.

As late as 1913 we had three hundred thousand hunters; now we have nearly a million. We kill about nine thousand tons of game in a year, and still have a breeding stock. Pennsylvania is a game state, one of the best. Not everything was done that might have been done, but I think everybody will agree that a remarkably good job was done. And with the past as a guide the people of our state are still capable of doing a good job in the future. The articles in the GAME NEWS show the necessity for work and activity, but they do not preach the doctrine of despair. Pennsylvania is now a great game state, and will continue to be a game state. Public hunting will endure because the state is such that it can endure, because half of it is in forests and the whole is well watered. Moreover, the people are imbued with the love of hunting as a recreation, and game is a valuable asset.

When Bill Wolf's September 1913, arrives, the wraiths of the pioneers of 1900 will be there smiling and saying to the ghost of Bill Wolf "The Game Commission shall endure," and to Ross Leffler, we heed your prophetic words, and the Commonwealth is still the greatest state on earth and the best place to live in, and our natural resources are restored.

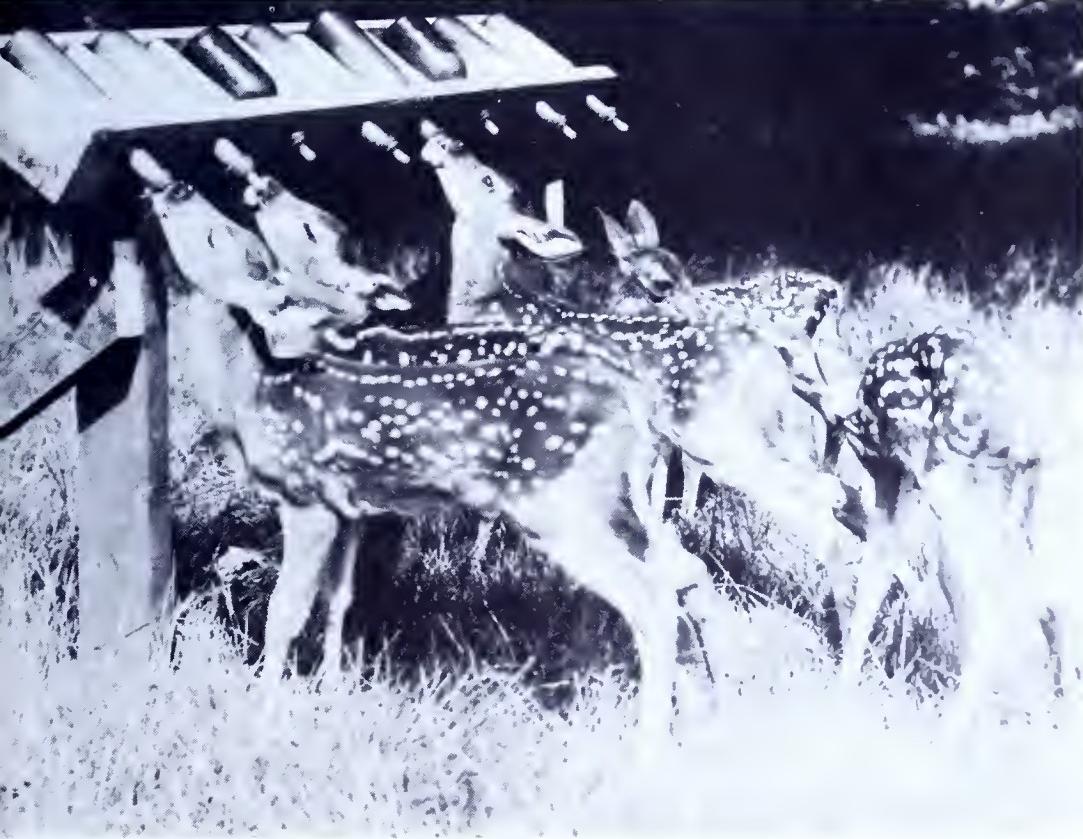
Bill Wolf prophesies that the Game Commission will not endure beyond the year 2050 ("unless") and bases that prophecy upon several reasons: I believe his principal

reason is because the courts about the year 1999 "ruled that all game was to be considered the property of the person on whose land it was found." He then cites many acts of vandalism, unsportsmanlike conduct, law violations that gradually provoked the landowners to post their lands against hunting, and certain other practices of persons and clubs to lease lands for hunting, until in the end it so wore down the practice of public hunting that it destroyed the game fund, and rendered the continuance of the Game Commission unnecessary, and for want of funds, impossible.

Bill Wolf tells the gloomy story in a very clear and readable manner, but he has reserved for his protec-

tion the word "unless" which indicates there may be hope "if" the proper means shall be taken to avoid the dire consequence he predicts.

Mr. Leffler's article states very lucidly that if our natural resources are continued to be ruthlessly exploited, and no proper effort is made to restore such as are restorable, the Commonwealth will suffer a slow but sure decline, and abject poverty. He too impliedly holds out the hope that the dire end may be averted if proper efforts are made to restore and conserve our natural resources. Neither of the authors of those articles describes the methods to be used to divert disaster, leaving the methods to be set up or blueprinted by the people so they may be brought to



Penna. Game Comm. Photo

Deer are still too numerous for their own good in many parts of the Commonwealth. Too often sympathetic people rescue fawns which they think are lost. There is a penalty for this practice. The animals should be left in the woods where they belong. Every year the Commission plays foster parents to a crop of these youngsters such as the group at the above chow line at the Loyalsock Game Farm.

fruition in accordance with sensible plans and specifications.

Finally, among the remedies which may be contained in the blueprint to be set up, I will presume to mention a few.

First, I do not believe that our courts even as late as 1999 will reach the conclusion that the game animals and birds are the property of the landowners on whose land they are found. The landowners will not want it so, nor will the sportsmen allow it. I am a landowner. I have had some experience with game and game lands, having had a four hundred acre auxiliary game refuge on part of land of which I am a co-owner for more than twenty years. Beyond a certain number game animals become a nuisance, an injury to the farms. To have the game properly hunted and killed is of value to the farmer. When the land is not hunted over it becomes a refuge for vermin of various kinds, and no farmer can alone protect his farm from injury from them.

In our auxiliary game refuge there grew up an excess of deer, of foxes, minks, opossums, weasels, hawks, owls and crows, and when we cut the timber off it by a thinning process, the timbermen found and killed forty-one copperhead snakes, and ninety-one black snakes, many of the blacksnares at least five feet long. The small game did not increase in the refuge much beyond the increase outside of the refuge. There has not been any appreciable increase of small game. The refuge embraced a timber tract, and two abandoned farms. I would prefer to have it hunted over by sportsmen every year. I am satisfied that small game is essentially an annual crop, needing but a sufficient breeding stock, and that the best plan would be for the farmer to try to keep it so, and never to strive to take over the title, and with it, the responsibility of an owner of the wildlife. If it should happen that there should arise a judge misguided

or dishonest enough to try to vest the title to the wildlife in the land owner on whose land it is found, the land owner will get a very undesirable package of trouble, and will be injured.

Moreover, from my observations I consider that the farmer, by reason of our game administration, derives more benefit than injury, and that the little revenue he might obtain by endeavoring to sell or lease hunting privileges will in the end do him more harm than good. No farmer ever found it profitable to prosecute for poaching and, after some experience, he will drop it as he would a hot potato.

I am convinced that the main cause for the no trespass signs arises from vandalism, over-killing of game, and unsportsmanlike conduct. These causes can be eliminated, and the organized sportsmen will see to it that they are eliminated. The Game Commission will also see that it is done.

The preservation of our wild bird-life will appeal to the farmer as a great and important function of the game laws, and at length he will come to a full realization of the benefit he derives from it.

The forests of this state embrace upwards of six million acres of land, not suitable for agriculture. Over two and a half million acres have already been acquired by the Commonwealth, administered by the Forestry Department and by the Game Commission. These departments will continue the purchases of such land. They will be adapted to game and to timber production, and the location of more water dams. The sportsmen of the state, through the Game Commission, have purchased nearly a million acres of such lands over a period of twenty years. This land well handled by the Game Commission, will serve to perpetuate our wildlife.

So I do not despair. Our country is a land of wide open spaces, not alone one of small farms. There is

plenty of room for the game to live, and to provide a surplus for the hunters. As to the loss of our restorable natural resources of timber, water and soil, the enterprises of our people will see to it that they will be restored. Restoration has already been begun sufficiently to indicate that the process will be continued.

I will put the end of game adminis-

tration far, far beyond the 13th day of September, 2050, and fix another period, suggested by the poet in his lines:

"Until the sun grows cold,  
And the stars are old  
And the leaves of the book of life  
unfold."

. . . *The End*



Photo by Klingensmith

*"Until the sun grows cold . . . . ."*

# State Game Lands— What and Where

**W**HAT are the State Game Lands? That question has been asked by numerous readers of the GAME NEWS.

Surely you have a reason for requesting information on State Game Lands, because money received from the sale of hunting licenses purchased these lands. State Game Lands were obtained to provide public hunting and refuges necessary to conserve wildlife. *Except for refuges and propagation areas within their boundaries hunting and trapping is permitted by the public throughout the Game Lands during the open seasons.*

Where are they located and how much acreage do they comprise? At present, your State Game Lands total over 900,000 acres situated in 63 of the 67 counties in Pennsylvania. Therefore, the chances are there are one or more tracts in your home county.\*

\*Ed. Note:—Our Sportsman's Map of Pennsylvania (15¢) shows location, number and relative size of all State Game Lands, as well as other features of interest to the outdoorsman.

Big timber, scrub oak, slashings, weedy fields, woodlots and excellent farm areas are all found on State Game Lands. Although most of this acreage is wooded and primarily utilized as hunting grounds for large game species, wild turkeys, ruffed grouse and squirrels, thousands of acres of fields, now under intensive management as wildlife areas, provide sport for the small game hunter. Due to increased posting of private lands and the fact that the game population has increased with improvement of food and cover conditions, these hunting areas are becoming increasingly popular.

Areas suitable for waterfowl are not too plentiful in Pennsylvania, but there are many lakes and beaver dams on State Game Lands. With the new waterfowl program in this state and continuous food and cover improvements on State Game Lands, hunters are bagging thousands of ducks and geese annually.

Although they provide only a small percentage of the hunting area over which Pennsylvania hunters tramp in the fall, State Game Lands are utilized by thousands of license holders. You should get acquainted with these lands in your locality.

On the heavily wooded State Game Lands, small blocks of timber or cut-over areas, and openings planted to grasses and clovers, will be observed. Managed for the production of wildlife, these forest openings are created to encourage the production of low growing, berry-producing shrubs necessary as food and cover for game, and to create browse areas at locations where the clovers have been seeded.

On field and farm areas, clumps of evergreens, alternating strips of clovers, grains and wide fence rows will be noted. Here, wildlife management practices are being applied to encourage the maximum production of game on each area.

Don't forget the fishing! Hundreds of miles of excellent streams flow through State Game Lands. In addition, many of the ponds and lakes yield game and pan fish. With proper stream improvement and periodic stocking the recreational value of these fishing waters and the State Game Lands will increase.

Your local District Game Protector will be only too glad to give direc-

tions to the nearest lands. Boundary tags and large road markers clearly designate the locations of State Game Lands. Refuges thereon are properly posted. Join your friends and enjoy a hike over these State Game Lands. We are sure you will return for an enjoyable hunting trip next fall.



Photo by Maslowski & Goodpaster

*State Game Lands provide the utmost in recreation, including intimate glimpses of many wild creatures.*

# Pipeline Coon

By RICHARD ALDEN KNIGHT

DURING the past ten years, I've lost more than my share of sleep hunting raccoon. I have barked my shins on coral in the Florida Keys, raked myself on scrub in the Carolina back country, and fought my way through briars and laurel in Pennsylvania. In the process of enduring this punishment, I have hunted behind a number of dogs—good, bad and indifferent. The bad and indifferent dogs, unfortunately, outnumbered the good ones by a tremendous majority. Up to a short while ago, coon hunting as a whole left me cold.

Several months ago, I accepted an invitation to go on a deluxe coon hunt with an old friend of mine, Warden George Gross of Renovo, Pennsylvania. Having been assured of comfort and ease of hunting, in addition to a large number of raccoon, I arrived at George's house in the mountains of Leidy township in time for dinner. My host greeted me cheerfully. "All set for those coon?"

I allowed as how I didn't drive seventy odd miles to admire his local scenery and we went around back to meet the most important member of the evening's party. Tied to a kennel in the back yard, a large black and tan hound saluted us joyously. Deepchested and square muzzled, Jack was a husky and very able-appearing animal. Then, too, enjoying the reputation of the "Best Damn Coon Hound in the State" as George claimed, I felt he didn't have too much to outdo. As I said so. When George looked hurt, I enlarged on this.

"I've listened to some of the prettiest hound music you could ask for, at all conceivable hours of the night. I've heard them beller their way out

of sight and hearing and be gone for the next two days. I've seen dogs wind up screaming their lungs out down a backtrack and, on two occasions, prevented owners from slaughtering same on the spot. In all the coon hunting I've done, such as it is, there have been very few coon produced. Oh, there are a few exceptions. A friend of mine in Homestead, Florida, owns an airedale strain dog named Admiral that is death on coon and possum. But for my money, just like any other dog going, the good coon dogs are damn few and far between."

George snorted. "If that's all that's worrying you, we won't have much to bother with tonight. Let's get some dinner."

If the inventor of the Jeep ever knew the uses it was to be subjected to, I doubt if he would have believed them possible. Jack and I shared the passenger side as George left the drive, forded a stream behind the house and took off up a winding log road toward a nearby ridge. As we bounced along the ruts, George shouted at me over the noise of the engine. "We're going up on top first. Too early for those coon to be in the bottoms yet. Lot of oak and beech up here. Coon like it—plenty of food."

I nodded my head and held on. Every time the Jeep would bounce, Jack's sixty-odd pounds would land on my insteps. He would grunt, brace himself and look at me reproachfully. George glanced at him and laughed. "The big hammerhead likes you or he'd run you into the back seat. That's his place you're in and as long as he's willing to share it with you, you've made a friend. If he don't like somebody, he don't



Photo by Author

*"Jack bayed tree high on a mountain to our left."*

argue—he just bites them. But like or not, don't try to pick up a coon with him around. He worries about that. All the coon we get belong to me as far as he's concerned. Get's right surly about it too."

With a heave and a grunt and dual low, the Jeep scaled the steepest grade I have ever covered on four wheels. At the top, George stopped the infernal machine and Jack tried to dig a hole in the canvas side before I could get the door open. I managed to free the latch and Jack piled out over me and vanished into the darkness.

Dark was the word for it too. There wasn't the faintest flicker of moonlight on the mountain and the only illumination for miles came from the derrick lights of the many

gas wells in the district. I turned to George and asked, "When do we see him again—sometime next week?"

My host exploded. "You're hunting over a real coon dog tonight, not one of these amateur hounds you've been talking about all evening. Now, he'll go out across that flat (he gestured out into the darkness) and if there aren't any coon on it, he'll come back."

I may have sounded sarcastic at the time, but I felt it. "You don't mind if I spend the night waiting here for him with you, do you?" George wouldn't honor this with an answer.

There is nothing quieter in this world than the top of a mountain on a dark night. Twice, we heard deer go off the flat when the dog



Photo by Maslowski & Goodpaster

*"George spotted the coon with the beam of his flashlight."*

flushed them. The woods are full of little sounds you wouldn't pay the slightest attention to unless you are listening carefully. The whistle of a night-flying bird's wings as he passes unseen above you; the scrambling rustle of little animals in the leaves—all of these are magnified immensely by the power of darkness. Conversation is kept at a minimum, as we were both listening for the dog. Jack is a silent trailer. This, to my way of thinking, is a definite advantage. Admittedly, it isn't as pretty as a big, loud-going hound screaming his head off, but it puts a coon up a tree in about a quarter of the time.

Fifteen minutes passed—no Jack. I stared holed in the darkness and wondered what had possessed me to let myself be put in such a position. Then, as quietly as he had vanished, Jack appeared. He padded out of the

brush near me and like unto scared me out of seven years growth. Panting, he looked up at us as he reassured us that there wasn't a coon on THAT flat, b'god.

Five hundred yards up the line we dropped Jack again. This time it didn't take him very long to connect. About ten minutes after we put him down, he bayed tree high on the mountain to our left. George led the way.

Jack's coon-finding abilities were above reproach, but his choice of treeing locations certainly could have stood some revision. We piled over windfalls until I felt like a lost squirrel and, finally, arriving at the tree, we found it in the middle of a waist-high briar patch. Fighting our way through the briars, we flashed our lights up in the branches. If that coon had tried to climb any

higher, he'd have run out of tree. I remarked on this to George. "That reminds me of a story," he said. "Jack put a bear to bay last year. He wasn't big as bears go, about one hundred and fifty, I guess. Well, this bear backed up against a big hemlock tree and was swattin' at the dog every time he came anywhere near him. I was hunting with two guys from down the line that hadn't lost any bears, believe me. They backed off and wanted to shoot the dumb critter. Well, I barged in past Jack with my flashlight and shined it right in Mr. Bear's eyes and yelled at him. He went up that hemlock just aknockin' down bark and branches. What he forgot was that the tree wasn't very high and he ran right out the top. He hit the ground from about twenty feet up and Jack nipped him. So far as I know, he is still running. He knocked down enough timber on this mountain getting out of here to build a full-sized house." (All this while Jack was trying to climb a tree.)

Preliminaries finished, we stood under the tree and George spotted the coon with the beam of his big flashlight. "Shoot him in the head now," he said. "None of this body shootin'!"

I have never fancied myself as a pistol shot to any degree. Under normal conditions, I am fair, not good. But on a black dark night, shooting under very uncertain lighting conditions, with my eyes straining to see the sights, I would have been well-satisfied to hit within three feet of the target, let alone shoot him in the head. My first shot was wide about two feet. The second knocked bark off the limb to the right. George yelled in my ear. "Shoot him in the head, man, shoot him in the head!"

I looked over my shoulder at him. "Sure thing, Mr. Cross. Which eye?" Squinting down the barrel, I squeezed off the shot as carefully as I could. The thirty-eight bucked against my palm and the coon somersaulted off the limb. Jack nailed him on the

first bounce and finished off what was left.

George bent over the coon, pulled off the dog and shook his head morosely. "These outdoor writers—tell 'em to shoot a coon in the head and they hit it in the shoulders. Not bad for an amateur, though. You did hit it. I've taken out guys that couldn't do that well in twelve shots."

Back in the Jeep, Jack eyed me with high suspicion as George threw the dead coon in the back seat. That was his coon and he'd tolerate no claim jumping whatsoever. Satisfied that my intentions were honorable, he settled himself on my insteps once more and collapsed comfortably. George started carrying on a one-way conversation over the motor noise. "Lot of turkey usin' up here. See that scratchin' on way into that last tree? Wouldn't be a bit surprised if we saw some tonight. There's a right nice buck up ahead."

His "right nice buck" was one of the biggest deer I've ever seen. His rack glistened in the headlights as he froze for a second next to the fire line that cut off the pipe trail we were on. Then, almost as suddenly as he appeared, he was gone. To my way of thinking, Mother Nature handed out a gift when she gave animals the ability to run headlong through heavy brush at night and not break their necks. Even with the aid of a good flashlight, I still lose a fair amount of skin every time I try it.

George parked the jeep farther down the pipeline and, once more, Jack piled out over my lap. As he swung out through the darkness of the flat, George and I sat on the fender and smoked in silence. Minutes went by and then, over the other side of the ridge so that he sounded like he was barking in the next county, Jack sounded off.

I looked at George with dismay. "That animal finds coon in the damndest places."

"Finds 'em, don't he?" snorted after toil or weariness."

George and I had to hurry to keep up as he plowed into the brush.

Fortunately, the tree was by no means as far as it had sounded at first. Jack's voice boomed periodically to give us direction and we finally located him on the far downslope of the ridge, beyond a patch of laurel. But, like I said, Jack didn't much care where he found his game.

George was waiting under the tree as I struggled through the laurel. His light probed the tree for a minute and then he whistled softly. "There is ol' grampa coon hisself. Take a look at him. He's big around as a barrel."

George was right. The light was centered on the great-grandaddy of all the coon I had ever seen. He squatted in a crotch about forty feet up and his eyes looked like lamps as the light reflected in them. His big body bulged over either side of the limb, presenting a target that I felt even I could hit.

George turned to me with a twinkle in his eye. "Now, Dick, there is a target I think you might be able to shoot where you should. That there coon's head is right big and any plain fool should be able to hit it from here. Don't body shoot him now—that's too good a pelt to punch holes in."

I lined up the pistol on that target until I thought my arm would go numb from strain. Finally, I squeezed the trigger and hoped. The coon went two feet in the air with a convulsive leap and started the long fall. Jack met him at the bottom, shook him once and turned around wagging his tail. George chuckled. "Now that's the way to shoot 'em. See ol' Jack thanking you for saving him some extra work? Let's see where you hit him."

If I had tried to center the head any better than I did, I wouldn't have been far off. The slug had smashed through the throat and come

out between the eyes, giving me as clean a kill as I've ever made with a pistol.

Back at the Jeep, George turned to me and said, "Guess we had better be getting down to the bottoms. The critters will be movin' down there now. Next time we go out, I want you to come in the daytime. I want to show you the damage these devils can do to a trout stream during a low water summer like we had this year. Coons have turned over rocks in every small stream we got around here. All these little native trout are spawning now in about three to five inches of water and the coon take them right off their nest. Ever see a coon catch a fish? A little stream is made to order for them. They chase a little trout under a rock and then lay down on top of it. All four feet go under the rock and, bingo, dead trout. They can't do that when the water is at normal depth, but they really are living high now."

Across the road ahead of us darted a dark shape. I thought it was a cat and said so when George hit the brakes. "Cat, nothin'. That was a coon and a right good one at that. Git him, Jack!"

Jack took me apart getting out and plunged over the bank down toward a small stream that paralleled the road. We could hear him noiseing along the bank and then he came right back to us and under our feet. George shone the light down and there, projecting from the bank, was a culvert pipe about a foot and a half in diameter. As Jack scrambled in, I grabbed George's arm. "Don't let him kill that coon. I want a picture of him bringing it out."

I dashed back to the Jeep, slightly apprehensive at the sound of the battle that was taking place under the road. Fumbling in the dark for camera and flash equipment, I arrived back on the scene of hostilities just in time to see Jack back out of the culvert dragging a very large and

a very irate coon. George vaulted off the bank into the ditch and, grabbing a handful of dog and coon, managed to separate the war long enough for me to get set up. Then, still holding the now-furious coon by the back legs, he stuffed him back into the culvert and then let go of Jack. Better him than me. Jack dove into the culvert, took up the battle where he had left off, and in a grand national riot finished him off. George picked up the animal and came puffing back up the bank. "Next time you want a battle royal like that broken up, give me time to get out

my brass knuckles—Git back, Jack!"

As I have said before, I've hunted coon in a lot of places, over a lot of different country and behind a lot of indifferent dogs. But never have I had the pleasure of combining pleasure with good dog work plus a good evening's bag in the same hunt. The idea sounded intriguing at first and proved to be more than practical. It is a pity that there aren't more dogs like Jack and more pipelines as productive. Maybe there are. I'll keep looking for a while, I guess.

. . . . *The End.*

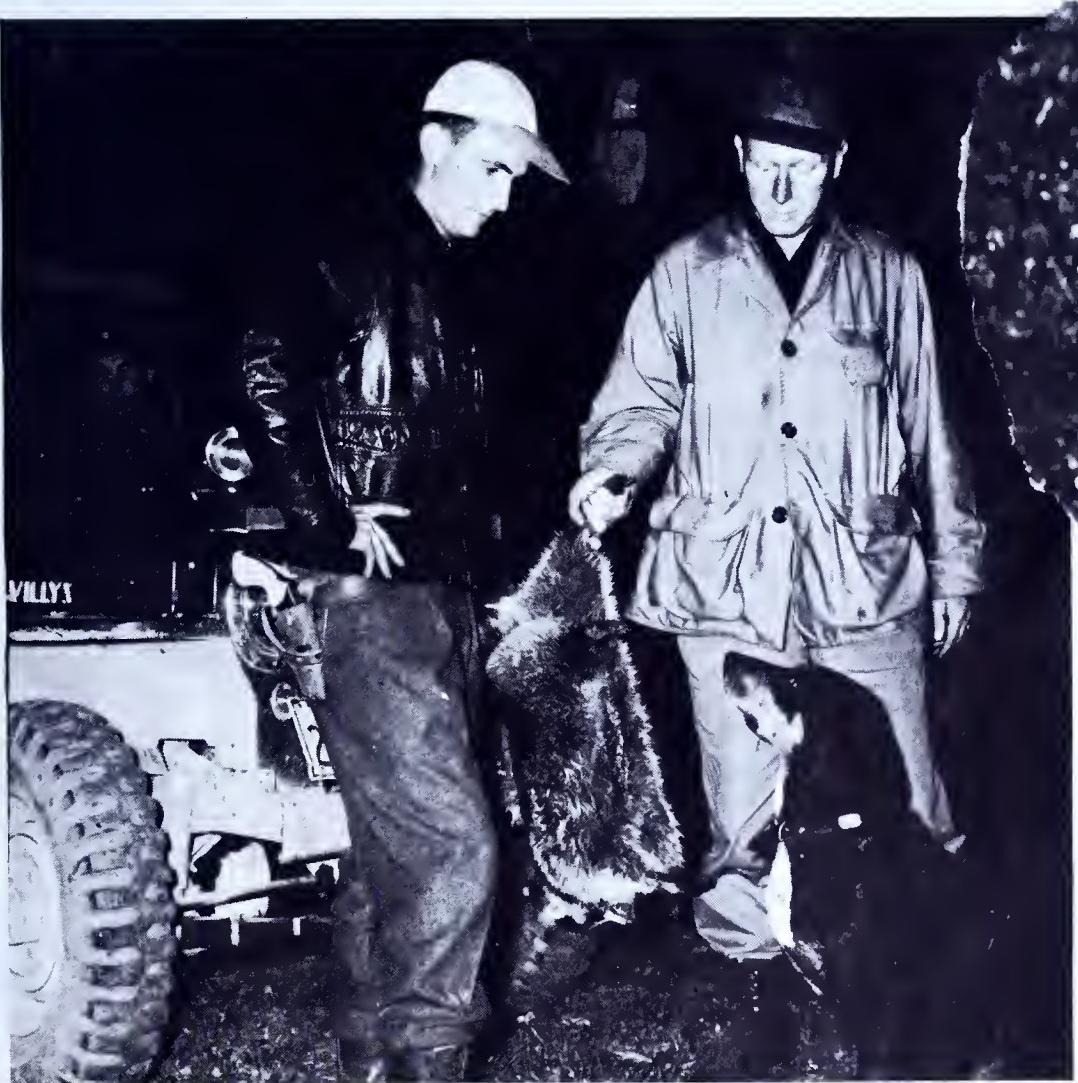


Photo by Author

*"Jack eyed me with high suspicion as George threw the coon in the jeep."*



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George

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twinkl the following pages, the is a writer has attempted a difficult to ig . . . to provide a code of thics for the sport of hunting which might be acceptable to all men. To attempt such a task, which would lend itself to controversy even in perfection, first required long association with the sport and with the men who follow it.

It is a product of sincerity if nothing else. For, it is written without prejudice; with a feeling of deep personal devotion to the out-of-doors and a genuine affection for the creatures which inhabit it; and, with a regard for the men with whom I share these sports which precludes any intended offense.

All sports have a set of rules, or laws, which govern the actions of those who engage in them. In the case of the spectator sports, there are penalties which might cause the offender to lose the game. In hunting,

Penna. Game Comm. Photo

## Religion in the Rough

By Keith C. Schuyler

there are fines and imprisonment for those who break the rules.

But, above and beyond all of this there is a code of ethics recognized by some which is governed only by their conscience. Usually this code is a matter of personal choice or convenience although some sportsmen's organizations do establish a code of sorts. Actually, however, there is need of a deeper, more significant personal code . . . a religion, or conscientious devotion to principles of the sport, by which a man can abide whether he is under the eye of his fellow man or the game protector or, companion only to himself.

Hunting is frequently referred to as recreation. There are those who might dispute this after an all-day hike through the woods and fields. But, it is recreation of a kind. And if we take the dictionary's version of recreation, we must take from hunting, "refreshment of mind or body



Penna. Game Comm. Photo

*"The man on a deer stand obviously is not in the mood for conversation but he will forgive you if you merely give him a polite nod and continue on your way with as little noise as possible."*

after toil or weariness."

If we are able to obtain the proper refreshment of mind or body, we must come from our sports with the same clean feeling only deserved by those who have played any game well.

#### Ethics Afield

The sport of hunting continues long into the telling of the experience, but the tale is almost always based upon what happens up to the moment that some living creature lies dead at the hunter's feet.

Whether this life was sacrificed in the spirit of St. Hubert, patron saint of all hunters, to greed, or for the sake of braggadocio, depends entirely upon the attitude of the hunter.

We often read and hear of the hunter's responsibility to his fellow man and to the land owner, both very important, but his primary responsibility is to the game he seeks. Although we term it sport, hunting is killing. We should show every consideration to the victim of our sport.

There is not a true sportsman alive who does not wish, at the end of the day, that he could release all the creatures that have fallen to his gun so that they could return to the arms of Mother Nature. Of course, this cannot be. Man, through his sport, has merely taken his share of the crop of creatures provided so that the other animals which prey upon them might be perpetuated.

It is a natural thing that these weaker creatures be sacrificed. Man need have no compunctions over having taken his share . . . as long as he has been fair about it.

There may be those who read these lines who look upon hunting as cruel, as pure savagery. However, were they informed, they would realize that nature is far more cruel than the gun or bow. Although few meat-eating animals ever purposely torture their victims, their manner of killing is often grisly.

A deer, or a moose, with its tendons slashed by wolves so that it is no longer able to stand is a pitiful sight. A nest of fledgling birds being devoured by a black snake presents an unpleasant picture. A snapping turtle dragging a duck beneath the water is a sickening glimpse of the out-of-doors.

Yet scenes such as, and similar to these, are repeated a thousand times a thousand times each day behind the beauty of the landscape. This is a side of nature seldom seen . . . but painfully present.

Man, in his sport of hunting, is following the instincts which stem from the time when hunting was a necessary part of his life. With necessity gone, he can now concentrate on making a sport out of his hunting. The game dinners which result from a successful day afield are only a happy coincidence to the sport.

Nevertheless, there are those who feel that they must feed their ego as well as their bellies. They are out primarily to fill their game bags.

Men who regard their hunting as purely sport cannot understand how anyone could shoot an animal or bird in its "nest" or "bed." Yet, I have many times seen a hunter step back and then blow the head from a rabbit sitting at his feet in the middle of a five acre field. Had he "kicked" the cottontail from the nest, he would have been assured at least the shot capacity of his gun at a moving target with the odds all in his favor.

Others will follow the same procedure if they find a bird sitting quietly in the grass or leaves, trusting upon its natural camouflage to conceal it from the hunter's eyes. I have known of extreme cases where-in a bird was shot while crouched in the grass in front of a pointing dog.

The same type of hunter will shoot into a squirrel's nest on the chance that a bushy-tail might be concealed there enjoying the sun. In

many instances, the hunter walks on to leave a dead animal to rot in the nest under the same sun. Unless, of course, the squirrel is only wounded enough to cause it to writhe from the nest or to go limping out the tree branch. And there are those so wounded that they can do neither but must suffer long before they succumb.

Some fellows will boast about how they saved a shell by clubbing a bird or an animal to death which trusted too much to its natural coloring. Others will tell how hard they worked to dig game from holes so that they could fill their game bags.

I recall one instance in which several hunters fired upon a female black bear sleeping in a cave before she could get to her feet. When the smoke had cleared, the hunters discovered that they had not only killed the mother bear, but the bullets had gone on through her to kill two illegal cubs hidden behind her.

There is little that can be said for the fellow who will shoot at something which he only thinks is game. The ridiculous death toll through hunting accidents each year is a blot upon the sport. Only God knows what makes a man appear to be a deer, complete with antlers, or a man's head appear to be a woodchuck, to some hunters.

By no stretch of the imagination are those guilty of these violations against the sport to be considered sportsmen. They are the game hogs and the killers who justify criticism which, unfortunately, falls upon all who carry a gun.

A part of our code should read . . . *Shoot no game not away from its bed or nest.*

Chance shots and long shots often result in wounded game which cannot be recovered.

These offenses against the game we seek are seldom obvious. Small game, especially, may not immediately show the effects of a few

grains of shot which doom it to slow death.

My suspicions are always aroused that the shot should never have been made in the first place when I hear someone boast about how he dropped his quarry at so many yards.

This always holds true in the case of small game shooting where a shotgun is used. Shot grains carry no farther for the expert than they do for the novice. And, in shots beyond the usually accepted range of the gun, the element of chance takes the margin of skill from the best shots and places them on a par with anyone who can point a gun at game.

In big game hunting, where one projectile does the job, the element of skill is most certainly an important factor. Yet, the most expert are limited by the type of weapon they carry, and no hunter has a right to attempt a shot beyond a distance at which he has reasonable certainty of scoring a clean kill.

I feel only revulsion at reading that Major-General G. A. Custer boasted that he killed antelope at up to 630 yards with a 50 cal. carbine using *iron sights* back in 1873. But then there has been much written about Custer that does not excite admiration.

Today, with the fine arms and optical sights that are available, some remarkable shots are possible. Nevertheless, any gun is limited to the ability of the man using it.

Certainly, few hunters can pinpoint their shot on a swiftly moving target in the brush even at close range. But, in close shooting with the average rifle today, the hunter always has a reasonable chance of downing his quarry on any shot which might cause a serious wound. He then has an excellent chance to finish off the animal should it attempt further to escape.

But a fleeting shot at long distances can often mean a lingering

death for some splendid specimen of big game.

Generally then, *don't attempt to stretch your ability or that of your weapon.*

Having given due consideration to the creatures that we seek in our pursuit of sport with the gun, we must turn to the so-called higher animal, the hunter himself.

More people are taking out a license each year. By the very purchase of a gun, and a license each becomes a hunter. Of course, not all hunters are sportsmen, but if we lay claim to that title ourselves, for the sake of example if nothing else, we must regard as one every other person who is hunting.

Many accidents which occur afield, if the truth were known, probably result from the victim's attempt to encroach upon another's hunting.

It is the hunter's responsibility to use the utmost care in shooting to ensure that he is not endangering another's life. By the same token, he must protect his own life by not placing himself in a position where he invites disaster. A mistake by either is a tragedy for both.

Despite the millions of hunters we have today, there is still plenty of room for all to hunt. The man who attempts to duck in ahead of other hunters close by, so as to be first at a favored spot, is asking for serious trouble. He is not only attempting to steal from the other fellow; he is inviting a load of shot or a bullet.

The man on a deer stand ordinarily is not in the mood for conversation. If you happen upon him while drifting through, he regards you as an unavoidable intruder. But, he will forgive you if you merely give him a polite nod and continue on your way with as little noise as possible.

I remember one instance when this circumstance worked in the re-

verse much to the chagrin of the rest of a party with whom I was hunting. We were driving for deer and had one talkative fellow on stand as half our weary and empty handed gang drove through a section of woodland. Another hunter not from our gang, happened upon our loquacious companion, and the two of them struck up a lively conversation just as we sent a deer toward them.

The stranger shot the deer from right in under the nose of our "friend."

There are occasions in both large and small game hunting when it is necessary that you be within gun range of others not hunting with you. Not only should you be aware of them, but you should make certain that they are aware of you. So . . . See, and be seen, without infringement.

Seldom will two hunters argue between them over a piece of game about which both shot. But, one of them may complain bitterly in private over the shot. The complaint may be because the other fellow stole the opportunity or because he immediately claimed the kill.

There are two types of gunners who produce such a situation. One is the quick-draw artist and the other is the "I got it" sureshot. Few fellows care much about who takes the game home, but practically all take pride in the kill and do not like to be robbed of the shot.

There is a simple and gentlemanly solution to this.

When more than one hunter is afield, first shot belongs to the one nearest the game when it flushes. He is the finder. The other should respect this right in the same spirit in which one bird dog is taught to honor another's point.

Exception to this can be taken when one man has had most of the shooting; then he should give his companion, or companions, every op-

portunity to get some shooting regardless of where the game flushes . . . within reason.

The kill should be credited to the first man who obviously wounds the game. For instance, if the first man merely feathers a bird which continues in full flight, it should belong to the man who puts it down. However, if the first shooter hits the bird sufficiently to start it down, the second man should regard his shot merely as an assist. And, even then he should shoot only if it appears obvious that the game might still be able to escape.

If you have the opportunity to prevent a badly wounded deer or bear from escaping, you should be pleased to stop it for the hunter first shooting it. However, if there is no evidence that the animal would die soon from the original wound, claim it; it is your kill.

It is not unusual for two hunters

to fire simultaneously at a piece of game with neither realizing that the other shot. The "I got it" fellow should first determine if anyone else shot, and the game should go to the one with the lightest bag. Unless, of course, there is positive evidence that one or the other made the kill.

The most ridiculous incident of which I have heard relative to claims on game involved two hunters, one of them the "I got it" type. A grouse was downed and an argument developed over who had killed it. The issue was decided when the hunters sat down and dissected the bird to count every shot grain in it. Each hunter was using different size shot, and the "lucky" one was determined as the one had put the most shot in the grouse.

First shot at a piece of game in front of a dog belongs to the hunter nearest the point. If the dog's owner feels otherwise, then he should hunt



*"I have many times seen a hunter step back and blow the head from a rabbit sitting at his feet in the middle of a field."*

alone. An exception to this might be taken again when one fellow has had most of the shooting. But the right to call the shot belongs to the man nearest the bird.

Many sportsmen follow these rules as a matter of course. They would be unpleasantly surprised to know how many hunters do not. There are situations which might alter the rules even beyond the extent of the exceptions noted, but in every case

. . . *Honor the finder; credit first blood; share the shooting.*

Most states are today engaged in extensive research to propagate and preserve their game supplies so that posterity might enjoy the pleasures of hunting. Laws have been passed and are constantly being altered for this purpose.

These laws are designed to protect the property owner on whose land game is found. They are written to ensure that each species of game will have a chance to reproduce itself.

Too, these laws protect the hunter from other hunters and from himself.

Seasons are established so that game is protected during two critical periods: (1) The breeding season, when young are born and raised. (2) The winter season, determined not so much by the calendar as when food and cover is at a minimum.

Bag limits and season limits are enforced in cases where hunting pressure might seriously affect the continuance of any species.

These laws are the result not only of research, but they are developed through experience and from field reports of men engaged in wildlife work. The best brains available for the studies are employed.

Too often the armchair hunter or the six-days-a-year Nimrod feels qualified to reject these laws for his own ideas and convenience. He just knows that the whole thing is a political racket especially designed to

annoy him as an individual. And there is always with us the fellow who thinks that laws are fine for everybody but himself.

Undoubtedly mistakes are made by well-meaning conservationists. Some laws would not stand up well under close scrutiny. Politicians probably do sometimes influence their colleagues to pass seemingly unnecessary legislation in regard to wildlife.

But seldom, if ever, will you find any laws which are downright detrimental to the sport of hunting.

Whether necessary or not, these laws do apply to everyone. While they are in force, they equally benefit or hinder all hunters, and in some way benefit the sport of hunting.

All laws are equally important from the standpoint of whether they should or should not be obeyed. So, our last rule is simply . . . *Obey the laws.*

Anything too wordy or cumbersome for the memory is soon forgotten. These five simple rules cover the important phases of hunting as a sport from both a moral and a legal standpoint. But, like any rule, each must be interpreted fully to be effective.

Hunting is excellent recreation, an excuse for regulated fun and an opportunity for fellowship. Above all, it is a sport. To keep it as a sport, observe five simple rules of ethics.

1. *Shoot no game not away from its bed or nest.*

2. *Don't attempt to stretch your ability or that of your weapon.*

3. *See, and be seen, without infringement.*

4. *Honor the finder; credit first blood; share the shooting.*

5. *Obey the laws.*

. . . *The End*

# A Day With The Junior "Ikes"

By Grace O. Beach

**W**E had a big date with three of our Junior Conservationists to take a field trip last week-end. We picked them up at daybreak so we could get in all the things they planned to do for the day. The three of them had enough ideas lined up to keep us busy for a month.

The vigor and vitality of these youngsters and the agility and curiosity of their minds, keeps you on your toes. This promised to be an extra special day.

There are nine boys in this particular Junior "Ike" Conservation Club and we take three on a trip, for that is about as many boys as we can successfully handle at one time. This trip it was Jimmy, Tommy and Donny's turn.

Previous to the trip, we held a little planning meeting and as usual let the youngsters take the initiative. A menu was planned and a shopping list made up by the boys.

The youngsters decided on hamburgers with all the fixins, fried potatoes, hard boiled eggs, sliced tomatoes, pickles and cake, iced tea, and pop. As a surprise, we stowed in a wedge of watermelon for everybody.

After the menu and shopping list were completed, they decided what they wanted to see and do, and the best spot to meet the program. We all agreed on a not too distant Game Lands as made to order. We never discourage their plans, but we did point out that they were planning a rather large order so there should be no disappointments if they could not be successfully carried out.

Not daunted in the least, they decided to make up a schedule for the day and one of the boys was

elected to do the job. Laboriously, he went to work, his tongue clamped between his teeth as his pencil traced out time and events on paper. It is doubtful if the schedule would ever have been completed if that tongue hadn't done such a swell overtime job.

Saturday morning the skies looked equal to the affair and the weather reports had promised good weather. We stowed our gear and supplies into the car and drove around to pick up our boys, who were eagerly awaiting our arrival. We had the distinct feeling they had pulled Mickey Mouses on us to check our timing, not once, but several times.

As we drove along the boys chattered among themselves and asked questions about things they saw, and others they just wanted to know about. All of a sudden, we came to an abrupt stop and our keen-eyed driver pointed ahead. Framed in the windshield like a picture was a mother hen pheasant and her chicks crossing the road. The boys were thrilled with the early morning stroll of a wildlife mother and her little family. Later we saw several deer and



Drawings by Ned Smith

*Everybody laughed when a grouse exploded in front of him*



Photo by Karl Maslowski.

*Tree frog. New discoveries will keep the boys occupied for many meetings to come.*

one doe with two little fawns near the edge of a clearing.

Finally, we arrived at our destination and parked our car. We got out what equipment we needed 'till lunch time and started out to hike to our first stop.

The first event on the program was a visit to a mountain stream that runs through the area, tumbling down over rocks into deep pools on its way down the mountain into the valley below.

During one of the meetings of this club we had tried to impress on the boys the idea of not becoming so absorbed in any sport, that they became intense instead of relaxed. If they did, they would miss many interesting and exciting events, for true sportsmen and conservationists always take time to observe. We gave them three things to remember—"Stop to observe, go quietly, use your eyes."

This thought, we were happy to learn had taken root, for the first thing on the program was to observe

the life in the air above and around the water, its surrounding habitat, and the life in the stream.

They started out by identifying the type of trees, and the shrubs and plants that provide food and cover for game and birds. When they failed to identify a species, special notes were taken and one of the group assigned to look up the information and bring it in to the next meeting. The boys always carry a small notebook and pencil on all trips.

Then some time was spent in observing the insects in the air and on the water. They were able to identify all but two and the other two boys got those assignments.

Next we turned our attention to the stream life. A fine net was held on the downstream side as we turned up stones and looked at the nymphs and aquatic life clinging to the under side of the rocks. These were all given close scrutiny, for this was their first introduction to water life. We didn't attempt to identify them on

this trip. It was an exploring, get-acquainted visit, and would send them back curious to learn more about these creatures and their life cycle.

These new discoveries will keep them occupied for the next couple meetings as they gather the information and learn to identify what they have seen. Then at another meeting an expert will be brought in to give them further information, answer questions and perhaps show them pictures of the various types of aquatic life and insects in and around streams.

Time was called on this event and we moved on up the path to the dam, where they proceeded to set up their fishing rods. This was a big moment for the boys. They had learned to tie flies and they wanted to try out these bugs they had made. Would they work, that was the big question?

They had all had casting lessons and with a few hints on where to drop their flies for best results they cast out on the water.

The flies worked and the boys all took a couple fish each which they carefully returned to the water. This was a field trip, not a fishing trip, one of the boys explained as he slipped his first fish back into the pond. Your editor and pardner looked at each other as we felt a warm glow of affection for these youngsters who are to be our future conservationists. We feel our resources will rest in good hands.

About this time there was some loud stage whispering and pointing up into a tree by one of the boys. We all gathered around him to see what exciting thing he had discovered. There hanging from a limb, head down, his wings folded about him was a red bat, sound asleep, worn out with his nights forage for food. Questions flew thick and fast, and that's another subject that will be on the agenda for some of the future meetings.

Someone checked with Mickey Mouse, our time keeper, and we found it was just about lunch time. We

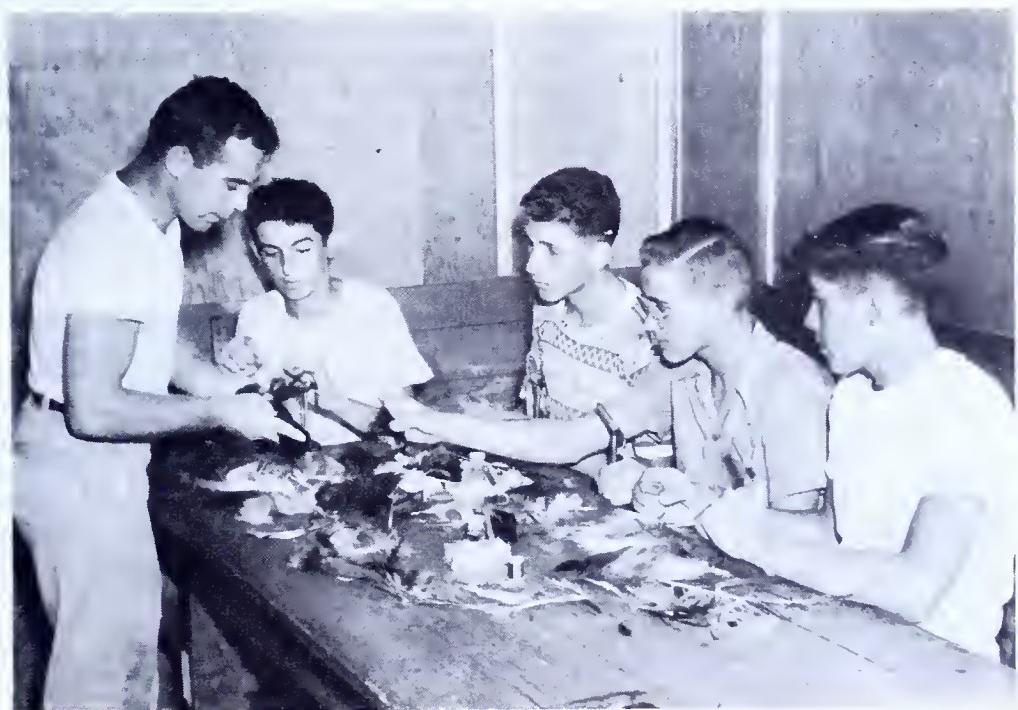


Photo by Hal Harrison.

*Their fly tying instructions paid off.*



Penna. Game Comm. Photo.

*Food plots on Game Lands were visited. This one will support turkeys and grouse.*

decided to hike back to the car and eat.

Back at the parking lot we picked out a nice shady spot nearby and hauled out our equipment and food. A large tarpaulin was spread out, the stove set up, and we fried the hamburgers and potatoes while the boys set the table on the plastic cloth spread out in the middle of the big tarpaulin. Then we all sat down to eat. Everyone was hungry and enjoyed our lunch including the surprise melon.

When lunch was finished and we had all properly relaxed and rested everything was packed up and put back in the car. The cleanup committee made a final inspection to see that not the least speck of litter of any kind was left to mar the beauty of this lovely woodland. The boys also picked up some paper left behind by a previous visitor. Every scrap was stowed away in a brown paper bag and put in the trunk of the car. Where there are no cans provided for trash we take it home to our own garbage can, it is never left behind.

Everything under control, we started to hike through the woods. Our next event was to visit a food plot on the hillside. These plots are put out by the Game Commission to supply food for game and the boys wanted to see what they were like. We moved very quietly, occasionally stopping and standing still while we looked around. Sitting quietly for a time on a fallen log, just looking and listening, we saw several squirrels and watched them running up trees and jumping from limb to limb as they followed their regular lanes of travel.

We heard a turkey off in the distance and in loud whispers the boys wondered if we might see them. There are a number in the area and we just might be lucky, we told them.

Further up the hill, one of the boys spied a jack-o-lantern and as he walked over to get a better look, something whizzed out from in front of him. It took him so completely by surprise and startled him so he lost his balance and sat right down on the ground with a look of amazed and frightened wonder on his face.

The woods rang with laughter when everyone realized that it was a grouse that had exploded in front of him. We all looked for it and finally located it so the boys got a good look at our beautiful state bird. "He isn't very big" said Tommy, "but he sure blew you down, Jim."

As we neared the food plots, we stopped to do a little approach planning. Unless our ears deceived us the gobble of the turkey had come from that direction. "If we are very quiet and very careful, we may get a look at a flock feeding," we told the boy.

Indians never moved more quietly than we did. It's doubtful if the boys even breathed. As we came just to the edge of the clearing we stopped and looked closely. We couldn't see a thing. We were just about to move out into the clearing when we heard a turkey gobbling and another chattering in answer. Finally, one of the boys spotted them on the far edge of the plot and the glasses were passed around so they could get a good look. There were seven of them.

I've never seen such excited kids. They couldn't get enough looking. We decided to move around the plot and see how close we could get. At one place it was quite open and we had an excellent view, close enough so we could watch them feeding without glasses.

Donny thought we should not attempt to get any closer so we would not disturb them at their supper. The others agreed, so we carefully withdrew and went back down the hill to the car. We were a trifle behind schedule, but the going was easy. The schedule had been a success.

When we got back to the car a man who had been fishing on the dam asked: "Is that your family, you all seem to be having so much fun together." We explained about our club and our trips and the boys assured him they had had a swell time. Such a chatter as they all talked at once telling him what they had seen.

The gentleman looked a little wistful and said: "You know, I've been meaning to take my kids along all summer but just didn't get around to it."

Donny piped up with "You'd better get going, the summer will soon be over and you don't know what your missing, how about that, Miss Diana?"

Yes, we think Donny is right. If you have been planning to take the youngsters on a trip, you'd better get going. There is still time. If you haven't any of your own take some of the neighbors children. You don't know what you're missing. It's the best way we know to keep young.

. . . *The End.*



Penna. Game Comm. Photo.

*Wild turkeys at the edge of a food plot.*

# Deer—or Timber?

By James M. McCullough

THE results of a study recently completed by the Cooperative Wildlife Research Unit, and the Department of Forestry at The Pennsylvania State College, indicate that the people of Pennsylvania are going to have to make a difficult choice. It was found that it is impossible to maintain large numbers of deer on a forested area without sacrificing a portion, and often a large portion, of the commercial value of the timber. During the present period of lumber and wood products shortage, this presents a serious economic problem.

This unfortunate destruction was discovered by measuring the amount of browsing on several study areas. These areas were selected in pairs, one enclosed by a deer-proof fence and an adjacent one unfenced. These were located in four different counties and represented four different forest cover types. The first was in clearcut strips of Virginia pine in Huntingdon County; the second in a clearcut plot of aspen in Centre County; the third in a clearcut strip of beech, birch, maple in McKean County; the fourth in a bulldozed area of chestnut oak in Elk County; and the fifth under immature and old growth beech-birch-maple stands in Elk County.

The study areas were sampled by measuring the extent of browsing on a series of thousandth-acre plots. By these measurements, the total damage to commercially important tree species was determined. The effect of browsing on the length of the rotation period (time between successive cuttings), the number of trees surviving the browsing, and the change in species composition were all considered in the damage evaluations.

Where deer populations were light



Penna. Game Comm. Photo.

*The extent of browsing was measured on the study areas.*

(approximately 1 deer to 75 acres), only 0 to 7 per cent of the stems were heavily browsed, and from 5 to 44 per cent were lightly browsed. The damage for these areas was appraised at 0 to \$0.87 per acre. In areas of heavy deer populations (approximately 1 deer to 35 acres or less), 25 to 78 per cent of the forest reproduction was heavily browsed, and 14 to 50 per cent was lightly browsed. The appraised damage on these areas ranged from \$4.23 to \$23.19 per acre.

Natural restocking of forest tree species was found to be adequate on all fenced plots on newly cut tracts. However, on the unfenced plots in regions of heavy deer populations, it was observed that the deer were destroying and retarding growth of commercially valuable hardwood timber species. Therefore, it was concluded that heavy concentrations of deer are capable of causing serious reductions in the establishment and growth of forest reproduction on newly cut areas of small size. And it

*(Continued on page 35)*

# Armstrong County

*Twenty-fifth In a Series*

*Note: If desired, this center sheet can be removed without damaging the magazine, by loosening the two center staples.*

## Land Area

The county contains 427,776 acres, of which 198,118 acres are forested. Publicly owned land comprises 2,473 acres, of which 2,417 acres are State Game Lands.

## Topography

While high in elevation Armstrong County is not mountainous. Much of the county's surface consists of small hills cut up by numerous small streams. Principal streams draining the area are the Allegheny and Kiskiminitas Rivers, and the Red Bank, Mahoning, Cowanshannock, Buffalo and Plum Creeks.

## Transportation

Railroad transportation is furnished by the Pennsylvania, the Baltimore & Ohio, the Pittsburgh & Shawmut, and the Western Allegheny Railroads. The Benjamin Franklin Highway (U. S. 422) and other important roads traverse the county, which has 572 miles of improved State highways.

## District Game Protector

H. E. Greenwald, Jr., Star Route, Apollo, has jurisdiction over Hovey, Perry, Brady's Bend, Sugar Creek, Washington, West Franklin, East Franklin, North Buffalo, South Buffalo, Bethel, Gilpin, Burrel, Parks, South Bend and Kiskiminitas Townships.

W. J. Brion, Box 129 Kittanning, has jurisdiction over Madison,

Mahoning, Red Bank, Boggs, Wayne, Reyburn, Valley, Cowanshannock, Manor, Kittanning, and Plum Creek Townships.

## Fish Warden

Clarence Shearer, Box 285, Freeport.

## Agriculture

While manufacturing has crowded agriculture out of the important place it once occupied, Armstrong County still values its farm products at nearly \$4,000,000, annually.

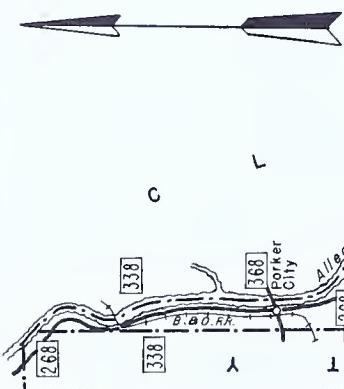
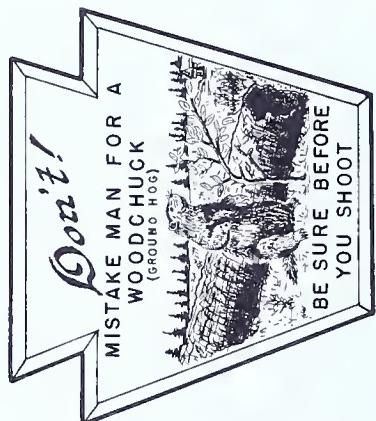
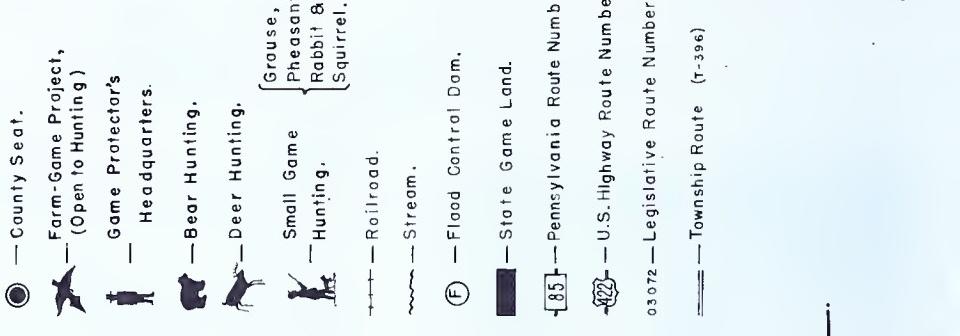
## Industry

Armstrong County embraces one of the State's most important industrial centers. Bituminous coal is mined extensively, and limestone and various clays are manufactured into crushed stone, flux, pottery, terra cotta, face brick and refractory products. Natural gas is found throughout the county, and oil is found in the northwest corner. At Ford City, named for Captain John B. Ford, father of the plate glass industry in America, is the largest plate glass plant in the world.

## Historic

The area later incorporated into Armstrong County was once a hotbed of Indian troubles. The atrocities committed by the Indians were so terrible that in September 1756, Colonel John Armstrong was dispatched with 300 men to the village of Kittanning, the largest Indian settlement west of the Allegheny Mountains. Here the cabins and huts were burned and many of the Indians were killed. During this campaign the enemy at one time surprised Colonel Armstrong's men and killed a number of them. The soldiers departed so quickly that they left their blankets, hence the present-

KEY



## ARMSTRONG COUNTY

PENNSYLVANIA

Score in miles

COONAR  
Edmon

ALLEGHENY COUNTY



Photo by Penna. Dept. of Commerce.

*Armstrong County boasts a high grade of bituminous coal mining.*

day name of the historic landmark, "Blanket Hill." Soon after the rout of the red men in Kittanning Fort, Armstrong was erected near Kittanning Bridge. Others who engaged in military exploits in the area were Colonel Daniel Broadhead, who was in command of Fort Pitt for a time, and Captain Samuel Brady, whom some historians credit with making the county's settlements more secure against Indian raids.

Most of the early settlers were Scotch-Irish, and many of these were Revolutionary soldiers who received land grants or "bounty lands" in reward for military service.

The county was formed from parts of Allegheny, Westmoreland, and Lycoming Counties in 1800, and was named in honor of Colonel Armstrong. Kittanning, the county seat, was laid out about 1803 on the site of the Indian village of the same name that was destroyed by Armstrong. For many years it was the terminal point of the old Kittanning Trail used by Indians and pioneers in their westward migrations.

One of Pennsylvania's Governors, William Freame Johnston, made his home in Armstrong County.

#### Recreation—Hunting

The county's rabbit hunting is generally excellent, while ringnecks are fairly abundant. Squirrel hunting is excellent in certain localities and the county enjoys good deer hunting. Turkey and bear hunting is practically non-existent.

Two State Game Lands are found in Armstrong County—Number 137, near South Bethlehem, consists of 1,114 acres; Number 105, near Kaylor, consists of 1,303 acres.

#### Recreation—Fishing

Fishable waters (name of stream or lake, fish stocked, location and length or area of stock waters) include: Cornplanter Run, brook trout, Boggsville, 2 mi.; Buffalo Creek, brown and rainbow trout, Worthington, 10 mi.; Huling Run, brook and rainbow trout, Cowansville, 7 mi.; Mill Run, brook trout, Kittanning, 4 mi.; Patterson Run, brook trout, Worthington, 5 mi.; Pine Creek North Fork, brook trout, Baum, 5 mi.; Scrubgrass Creek, brown trout, Goheenville, 4 mi.; Allegheny River, black bass, Freeport, 34 mi.

. . . *The End.*

(Continued from page 30)

is impractical to depend upon natural restocking or supplemental plantings for the establishment of fully stocked forests on similar areas. Profitable forest management would be extremely difficult, if not impossible, on areas similar to the three unfenced study plots where deer populations were heavy.

Where forests are overpopulated with deer, clearcutting on a scale large enough to produce an overabundance of reproduction would be necessary for the establishment of a satisfactory timber stand. However, clearcutting is not a desirable silvicultural system for most Pennsylvania forest types, except possibly for aspen. Therefore, it is obvious that good forest management in Pennsylvania depends upon protection against excessive deer populations, and this can be accomplished only through a regular and adequate harvest of both sexes during the open hunting season. Within reason, deer production and timber production are compatible enterprises, but to sacrifice our forests merely to maintain a superabundant big game population surely represents unwise management of our natural resources.

. . . The End.

## Notes on Bird Feeding

By John Shrader

Maintaining feeding stations all year around for the supplementary feeding of birds affords one an excellent opportunity for their observation. Watching birds not only leads to greater knowledge of them, their personalities and habits, but provides entertainment for us.

The feeding stations need not be elaborate. A patch of ground beneath a shrub or vine, a shallow tray attached to a building, a tree trunk or branch on which to place suet. Fancy, ornamental feeders may be a delight to the human eye, but they do not entice birds. The most important factor to the bird is free access to the food, with no hindrance to its arrival or departure. No bird wishes to place itself in a position where its sudden departure would be impeded.

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tural system for most Pennsylvania forest types, except possibly for aspen. Therefore, it is obvious that good forest management in Pennsylvania depends upon protection against excessive deer populations, and this can be accomplished only through a regular and adequate harvest of both sexes during the open hunting season. Within reason, deer production and timber production are compatible enterprises, but to sacrifice our forests merely to maintain a superabundant big game population surely represents unwise management of our natural resources.

the stations are not kept well filled at all times. Only in extreme weather, such as unusually deep snow, is food supplied abundantly. Small quantities placed out often is preferable



Photo by Author.

White-breasted nuthatch feeding on suet.

to a huge quantity at once. Especially so is this applicable where English sparrows, starlings and grackles are apt to raid the station. We usually place some at night for the early morning callers, then again in mid-morning and midafternoon.

Some observers are of the opinion that any artificial feeding is detrimental, holding that the birds eat at the stations and therefore do not eat their natural food. Others maintain that birds do forage naturally, and visit the stations only to add extra items to their diet. Both opinions should be considered, but we find that most birds look for their natural food when coming into the station and as they leave.

For an example let us take the downy woodpecker. He is a regular caller. As he approaches he darts from tree to tree diligently searching for food. After having helped himself at the feeder, he examines each tree as carefully as he departs. Often one woodpecker is feeding as another comes into the station. A favorite 'waiting room' for the second fellow is a clothes line prop, swinging nearby. Instead of waiting idly, however, the second fellow inspects the prop with the utmost care!

A wide variety of foods are attractive. Suet, or tallow rendered from suet, Cheddar or similar cheese, peanut butter, sunflower seeds, poultry scratch feed, millet, barley, brown and white rice, corn or wheat meal, bread, doughnuts, crackers and dried currants or raisins are used successfully. Dry soil, especially if sandy or gritty, and a shallow container of water complete the list.

The station facing our kitchen windows is arranged like this: On the bare earth beneath a rambler rose approximately eight feet from the house, we scatter the scratch feed and mixed grains with bread and bread crumbs; about five feet above on a small board attached to the trellis we place suet and on the window

ledge there is a little tray containing mixed grains and peanut butter spread thinly. Thus a nuthatch may be feeding on suet, cardinals cracking sunflower seeds on the ground below while song sparrows keep them company eating grains and crumbs, and tufted titmice peck away gingerly at the peanut butter at the window. A wooden bowl set in a depression in the earth nearby provides water, except in freezing weather.

While we noted before that the food is not lavishly distributed, suet is the one item that is available at all times during the winter. A group of chickadees may come by and begin to feed on it, one at a time. After a few moments three or four cocky tufted titmice make their appearance, driving away the chickadees. Then a lone nuthatch, belligerantly spreading wings and tail, chases the titmice. The nuthatch gives way to a downy woodpecker, and he in turn flies before a blue jay!

One winter a lonely chewink ate only soggy white bread—he avoided the brown crust, feeding on only the white inner portion. Last spring a catbird feeding its young would first obtain a larva or insect, then go to the station for peanut butter and take both to the nest. Often one can watch eight or ten song sparrows, a half dozen slate-colored juncos, as many white-throated sparrows and perhaps a fox sparrow feeding together on a winter day here in the hilly, rolling country of northern Chester County.

Certain birds adapt themselves readily to feeding in the presence of disturbing elements. A downy woodpecker ignored four young boys noisily playing cowboys and Indians within twenty feet, while a white breasted nuthatch ate peanut butter at the window feeder while dishes were being washed within four feet. Chickadees are friendly in the extreme, and sometimes flutter about one as the food is being placed.

. . . *The End.*



## *Outdoor Kids*

By Hal H. Harrison

BILLY and Jane learned a little poem one time that has helped them escape the tortures of poison ivy.

Perhaps you should learn it too. Here it is:

"Leaves three, let 'em be;  
Berries white, hide from sight."

By remembering that little rule, the Kids thus far have not broken out with that watery, itchy rash that comes from touching this dreaded plant. But since only one out of every five or six persons is safe around poison ivy, the children are never sure that someday they will not get it.

Persons who were never bothered with poison ivy when they were children sometimes are attacked in later years. So no one is ever sure, and the safe way is the careful way.

There is one thing that certainly has helped Billy and Jane and that is that they know poison ivy when they see it. They know what to keep away from. And on occasions when they knew they had accidentally touched the plant, they washed their arms and hands with yellow laundry soap. They may have helped, too.

Remember this: Poison ivy leaves always come in groups of three. This arrangement is called a "compound leaf" of three leaflets. Poison ivy is usually a vine which climbs over nearby vegetation and up tree trunks, but sometimes it is a shrub.

As a vine, poison ivy is often mistaken for Virginia creeper, but the Virginia creeper always has five leaves together, not three. And here is another rule to remember: "You can shake hands with five fingers but not with three."

In the western states, folks get a rash from a plant that belongs to the same family as the eastern poison ivy. It is called poison oak, and its leaves are shaped like oak leaves, not ivy. They, too, grow in threes. Poison oak produces the same rash that poison ivy does, and it is treated in the same way.

"Shots" may be taken by people who are likely to get poison ivy every year.

It is not true that sensitive persons can become poisoned just by standing near poison ivy. They must touch it in some way. But even touching clothing or shoes after brushing through poison ivy is enough for very sensitive people . . . or patting a dog that has contacted the plant, though dogs themselves are immune.

. . . *The End.*

## *"First-Aid for Foot-Wear"*

By DON SHINER

*Photos by Author*

PROBABLY you have heard some 'old timer' say that footwear is one of the most important considerations for the sportsman, for his feet are the only means of locomotion about the field. A tight boot, wet foot, or a blistered heel will spoil many a day in the outdoors. So it is important that your leather togs are the proper size and fit your feet well. If your present ones are too tight or loose for comfort, discard them for a pair that will fit better. When you have a pair that fit like kid gloves, take care of them and they will last for many years of hard trail use.

What type of boot is best for the outdoorsman in Penn's woods depends on the individual and the kind of use he will require. But one thing is certain, in territory where briars cover portions of fields and when climbing over rocks and hills in the woodlands, shoes with 'high tops' are ideal. These give support to the ankles and are less tiring, even on those long

distance hikes. These same high-top leather boots are the best to wear in poisonous snake areas during the warm weather seasons when these reptiles are active. The majority of venomous snakes strike below the knee and seldom penetrate leather with their fangs.

But regardless of the type footgear you wear afield, proper care for them is important. Wear a pair of wool socks. Wool will cushion the feet on those long hikes and will absorb perspiration. If you complain of cold feet while on stand for deer, and few sportsmen are immune to this, use an inner-sole made of wool or lamb skin inside the boots. They will keep your feet as warm as toast and will, in addition to the heavy socks, protect them while tramping over rugged terrain.

Snow and swamp water penetrate leather rather quickly so treat your footwear frequently with some sort of dressing. Rub the leather with



*Frequently applying saddle soap to the leather will keep the boot soft and pliable as a kid glove.*



*If you complain of cold feet while on a deer stand, wear lamb-skin innersoles. You'll find this will keep your feet as warm as if you were toasting them by an open fire.*

tallow or saddle soap for this will keep it soft, pliable and it will be less likely to chafe, break or become hard. Your feet will be more comfortable because the soft leather covering will not bind but will give and bend with each step. Dressing the leather occasionally will cause it to wear longer even with excess abuse.

Proper first-aid for footgear calls for removing the dirt and mud after each trip afield. There is a good reason for cleansing them after each day's wear. The dust collected on them while plodding over the country roads quickly dries the oils in the leather. The boots then become excessively dry and soon shrink and crack.

Tramping through the fields and having them torn and scratched by hard day's work out restores the softness of the leather. The briars, coarse weeds and brush damages the leather too. But cleansing and applying a dressing after a long day's work out restores the softness to the leather.

*After each trip outdoors, clean the leather and remove the mud and dirt from the soles. The leather will stay softer for a longer time.*

Blisters, corns and bunions have no place on the feet of sportsmen. To tramp about the great outdoors when plagued with these is a great hardship. It is work to take an extra step, not to mention the tortures! A day's hunt is less tiring when the feet are in good condition because of proper footgear and it is refreshing to return home with rested feet still eager to travel. You will find that hunting and tramping about in the outdoors are even more a pleasure.

Once you have removed most of the dust and dirt and have applied a leather dressing, hang the boots on a nail or stand them in a dust free corner of a closet. Don't allow the tops to fold down if it can be helped.

These simple treatments for your footwear will pay off in big dividends. You will find they will last many seasons longer and will keep your feet in better condition. That is important for one's feet are the only means of locomotion in the outdoors.



*When storing them for any length of time, hang them up and don't let the tops droop over if it can be helped.*





*Play it SAFE, always!*

Photo by Henry M. Blatner

# The Shotgun Stock Must Fit

By Ed Shearer

**L**AST month we took a look at the shotguns that will be available to the hunters this fall and what the newcomer could expect to get for his money. My friends in the sporting goods trade say that of the thousands of new guns that will be sold this year, most will go to comparatively new hunters. So in selecting the new shotgun let us consider some factors that will make or break your chances of success with the new gun.

Close study and observation over the years attributes the majority of misses by the average hunter to poor stock fit and excessive choke for the individual's skill. Of these evils a poor-fitting stock is by far the worst of the two. Even an indifferent shot can make a fair showing with a full choke gun provided the stock is a perfect fit. But the reverse is not true. Even open boring does little to overcome the handicap of a poor fitting stock.

Last fall a chap complained about the tight choke in his gun—told me he could not hit anything. He figured on sawing off 4 inches to open up the pattern, but I suggested he try some brush loads before commencing hack saw operations (he had a high grade gun and barrels are expensive). A few days later he told me that it was some better but not much. As I always had good results with these loads and was convinced that he was scratching them down with the edge of the pattern, an indication of poor stock fit.

Investigation showed the gun was throwing the charge so high that even a brush load could not quite make up for it. By changing the pitch on that particular stock it was possible to bring the pattern down where it belonged, resulting in his average

taking a sharp climb with regular loads and going definitely higher with brush loads. Clean kills become the rule rather than the exception.

For some inexplicable reason hundreds of articles are written on the comparatively unimportant fit of rifle stocks, but few on shotgun stocks, the correct fit of which is the very foundation of good shotgun work.

For example, take the stock on the 1903 model Springfield. Any similarity to a good rifle stock is purely a coincidence. Yet the scores that were shot with this rifle at Camp Perry show that a good rifle shot can do good shooting with almost any kind of a rifle stock.

The crying need in shotgun shooting is speed—that's why a scattergun stock *must* fit. Even on a running deer the rifleman usually has 4 or 5 seconds in which to align his sights (deer do not ordinarily run nearly as fast as you think they do) and when these sights are lined up the bullet goes there regardless of stock fit.

Now a good trap or skeet shooter gets a shot away in one second flat; a two second man is going to miss a lot of targets. In upland shooting that extra second can often mean the difference between game in the coat, and a cheerless, though not jeerless, trip home. Here is an entirely different condition. The front part of your barrel is your front sight while the stock itself is your rear sight. If it's



a perfect fit your shot pattern will go where you are looking. If the stock is too straight or too crooked the shot pattern goes over or under the game. If the comb is too thin or too thick the shot pattern goes to the left or right of the game.

In rifle terminology, the stock controls both your elevation and windage. But there is one thing you can gamble on. When a rabbit is running through a briar patch or tall grass; when a quail is within diving distance of a honeysuckle lined gully; when a grouse is banking for his curve that takes him behind thick cover or a cock pheasant is rocketing along at 35 yards, then speed is the only thing that will serve and it must be accurate.

This is the acid test of a perfect fitting stock. There is no time to try to line up the gun—the stock must do that automatically as the gun butt hits the shoulder.

Our old-time American gunmakers regularly furnished stocks with far too much drop in them. Thirty inch full choked barrels and a  $3\frac{1}{2}$  inch heel drop was just about standard when I was a youngster. As I look back I can see the reason for this. We were primarily still a nation of riflemen, consequently we thought of our shotguns in terms of conscious aim and range. To further this fallacy small game was plentiful and if you missed there would be another coming up shortly that would be right down your alley.

There were some specialists who were way ahead of their time. They imported some fine English shotguns and these few were really good. With 100 years' experience in shooting driven game on their preserves the English developed the shotgun much as we know it today. They shortened the barrels, and lengthened and straightened the stock. They



Penna. Game Comm. Photo

*"If its a perfect fit your shot pattern will go where you are looking."*

lightened the gun to make it fast handling for the incomers and opened the choke to give larger patterns for crossing and angle shots. They evolved the straight grip stock which gave better and faster trigger control on the 2 trigger double gun which is standard with the English even to this day. They never went for the pump and automatic shotguns.

Trap shooting gave the American shotgun its first big boost toward a better field gun. The shooters quickly learned that the crooked stock had as many faults as a hound dog has fleas. They found they were slow in getting on a fast moving target and slower still when they aimed down the rib. In addition, they had a tendency to undershoot on a fast moving target. Two sights on the rib were common at that time.

The sloping combs on their crooked stocks got them into trouble because every time the cheek was placed differently the slope of the comb changed the elevation. They also found the excessive drop resulted in a lot more recoil, an important consideration when 50 or 100 shots were fired in a single afternoon. Furthermore the small, thin fore-ends afforded the hands little protection against the hot barrels.

Trapshooting fans brought about the first radical change for the better in American stocks. They straightened the stock, which cut down recoil because it traveled back in a straight line. They lengthened the stock, making the gun faster and better handling and allowing a place for the thumb where it wouldn't give the shooter a bust in the beak every time he pulled the trigger. A higher straight comb on the stock gave more constant elevation, and tended to throw the shot pattern a bit high. This was just what the doctor ordered on rapidly raising targets.

One of the best of the new features from a field stand-point was the beavertail fore-end. Designed to pro-

tect the hand from hot barrels, it was soon found that the left hand could be moved towards the muzzle, giving the shooter much better control of the swing and alignment and taking up much of the recoil.

Skeet shooting really developed the field gun as we know it today. The game was designed to give the hunter practice more in line with conditions he would encounter afield. Doubles and varied angles called for speed. The trap stock was too long and too straight for fast-moving targets that were not always rising. The average barrel length of 30 inches was found to be too slow, so 26 inches became standard. The boring was opened to give wider shot patterns. Muzzle devices came into use and proved their worth in the field.

So the new ideas on how a field or skeet gun should fit added up to this: the comb should be high enough so that when the cheek is pressed hard against it, the eye should be looking right down the center of the barrel. If the eye sees only the receiver and none of the barrel the comb is too low and the gun will shoot low. If you put the gun to your shoulder with the cheek pressed firmly against the comb and you see the whole barrel length the comb is too high and the gun will throw its shot pattern high. This will cause plenty of grief in the field where the angles are varied.

Stock length has been the cause of much research by some of our arms companies. It was found that a stock length of 14 inches would come close to fitting a man of normal height. The average drop at the comb of our standard factory guns runs about  $1\frac{5}{8}$  inches and from  $2\frac{1}{2}$  to  $2\frac{3}{4}$  inches at the heel. As shooters come in assorted sizes a good rule on stocks is the following; they should be long enough to keep your thumb from banging your nose and short enough to come to the shoulder fast.

Another factor that has a bearing on stock fit is pitch. This refers to

the angle that the butt is cut or the butt plate is put on. The function of pitch is to keep the gun firmly on the shoulder and the barrel in proper alignment. Changing pitch through the use of shims under the butt plate will raise or lower the pattern within certain limits.

Keeping these facts in mind in selecting a new shotgun, ask yourself these questions. When you press your cheek firmly against the comb is your eye looking straight down the center of the barrel? If so the comb is OK.

Does the gun come to your shoulder smoothly, does it stay naturally and does it keep your thumb away from your nose? If so the length and pitch are all right and the chances are you can shoot that gun.

In general the rabbit hunter can stand more drop than the wing shooter as his angles are lower. Stock can be altered within some limits. But one thing is sure. If you are ever to become a good field shot your shotgun stock must fit.

. . . *The End.*

Penna. Game Comm. Photo

*The end of a perfect day.*



# Outdoor Reveries

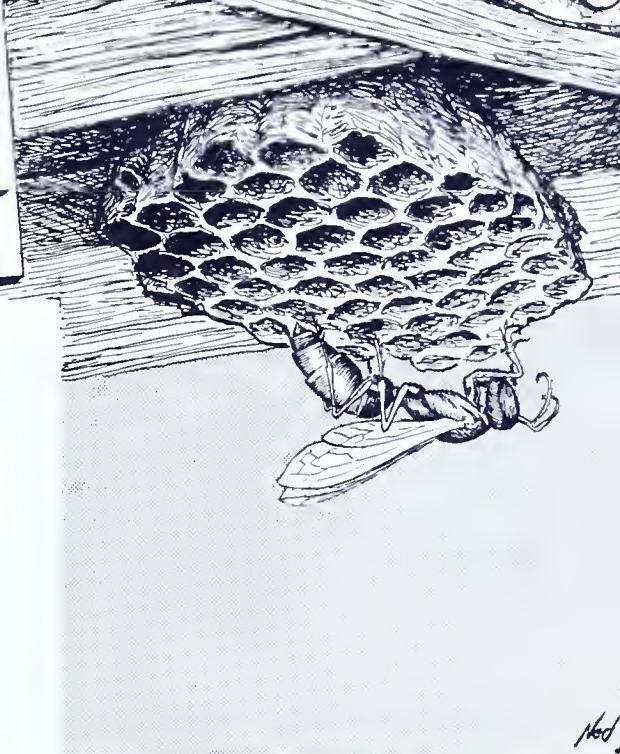
## Huntin' "Sang"

By John H. Day

MY FRIEND the old ginseng hunter led the way and I puffed and pulled and hauled my creaking joints along behind in a scrambling climb up one of the wildest ravines I have yet explored in my hiking territory. Despite the long-continued drought and the parched and burning fields outside, here in the cool shade the loamy banks were moist and slippery and the music of dripping and tumbling water echoed in the rocky fastness. Centuries of frost and winter sun and the steady caress of free-flowing water had carved this fearsome gorge, shaping a hidden wander-way to delight the rambling countryman.

As we climbed up through the raging rocks each higher level revealed new scenic bits of rugged grandeur. Huge boulders and massive hulks of broken sandstone lay jumbled in a sort of awful beauty. Much of the ascent was across slippery facings, where one misstep could have meant a twisted ankle or a cracked bone.

At each new level we searched the loam banks on either side for the rare ginseng, that once-common woodland plant which has been so pitilessly hunted out that finding a surviving stalk is a red-letter occurrence. I had never knowingly seen the plant and the old "sang" hunter was determined that we should locate at least one.



Higher and higher we climbed through the gorge and wilder and wilder grew the surroundings, until finally we came into a sort of cavernous amphitheatre. Here in a semicircle are great overhanging outcroppings, providing cave-like shelter which old timers say was often utilized by prowling redskins. I walked beneath the beetling brows of the overhang, treading in dry leaves three feet deep.

Where the stream breaks through huge chunks of rockery are strewn about in mad confusion. An aged hemlock clings to the very edge of the sheer cliff overhead, casting a gloomy shade into the gorge. This rocky vale lies close by one of the old Indian travel routes. Perhaps the fiery Pontiac held high council with his chiefs in this hidden rampart. Who knows?

I was pleased to find a small mat of the rather rare walking fern growing on the face of one of the big boulders. The fern known as narrow-leaved spleenwort has established a thriving colony in the area. As we started back down the ravine a pert chipmunk scurried into his den,

leaving the echo of his indignant chirping behind him.

In September the ginseng shows a cluster of brilliant red berries in the midst of its three-divided leaves. So we concentrated our search on the tell-tale berries, as we scoured a wide area of the steep wooded hillside. Indian turnip fruits held up their scarlet heads, and we saw the dark purple berries of wild sarsaparilla and the pale red speckled berries of the false Solomon's seal.

I followed the trace of a groundhog or fox trail, skidding across windfalls and averting occasional disaster by a last minute grab at a handy tree. Soon we discovered the reason for the scarcity of ginseng. Another hunter had been there before us. His boot tracks showed clearly in the damp shale and his progress was evident where he had ploughed through patches of water weeds.

We worked across a hog-back and explored the side of a branch gully leading back into the main gorge. I was about twenty feet above the stream, moving slowly on the tricky footing, when I walked right into a perfect plant, its odd bean-shaped berries bright red as advertized, and three leaves, each five-parted, looking something like a tiny group of woodbine leaves.

Thus it was that I found for the first time the rare ginseng, whose name is a corruption of the Chinese "jin-chen," meaning "like a man," from the odd similarity of the forked root to a wizened and crooked old man. The Chinese market for the dried roots has been so lucrative that the plant faces extinction. There must be something to the ginseng story. My appetite that evening was never better!

The little people who have moved in with us on the pleasant valley acres we call home have never heard of the housing shortage. Neither are they concerned with such troubling things as strikes, working hours or

lack of raw materials. Right now construction is being rushed on a whole series of new apartment houses. From the initial blue-printing right through to completion these dwellings will rise exactly on schedule.

Once the site has been chosen the labor gangs move in. Raw material stock piles are usually close at hand. Working hours are from sun-up to sun-down, with time off for chance refreshment as and when the opportunity arises.

One of the most interesting projects is the adobe hacienda now taking shape against a certain favored rafter in the garage. Following the conventional design for this type of dwelling, the little steel-blue engineer known as the "mud-dauber" will soon have her twelve-room lodge under roof and fully occupied.

Rooms are rented in this mud mansion as soon as the four walls are complete. In a final burst of generosity the builder not only decorates the dwelling but stocks it with ample provisions to sustain the tenant during occupancy. The nervous mud-dauber locates a supply of sticky mud, usually near a pond or stream. She rakes up a pellet of this mud about as big as a small pea and heads back to the chosen rafter.

After plastering a firm mud foundation, she builds up a long hollow tube about the size of a lead pencil. Then she goes hunting for spiders. When she finds the right victim she stings him in such a way that he is fully paralyzed but still alive. She carts this comatose spider home and pushes him in to the end of that first tube. More spiders follow until there is sufficient food crammed in to "do" the larval wasp. Then the mud-dauber lays a little white egg in the compartment, seals off the end and goes about the business of stalking enough spiders to provision the next cubicle.

In due course the egg hatches and the baby wasp eats his way through that spider "silage" until he is ful-

grown and ready to spin the tiny cocoon from which he will emerge a steel-blue wasp like mama. He will chew his way out through the mud wall and fly off to take up the ancestral building chores on his own. Later on I'll knock down that vacated mud apartment and the garage floor will be littered with spider legs and bits of brown cocoon husk amid the rubble of the adobe dwelling.

Community effort goes into the construction of several more pretentious abodes now in process of building about us. These are built of pre-fabricated material scraped by the labor battalions from weathered fence posts and other like sources of supply. The tomato stakes in the garden rows furnished a great part of the shavings which went into the sills and joists in these paper dwellings which have been engineered with consummate skill and precision.

The very common social wasps are the craftsmen involved in these projects. They learned the secret of paper making long before the pulp-wood tycoons moved into our forest areas. By chewing and macerating scrapings from my tomato stakes these builders produce a pulp paste which lends itself to building up the hexagonal rooms in their apartment dwellings and hardens to a stiff paper-like consistency.

We noticed some sabotage in the rose beds recently and knew at once that the solitary bee called the leaf-cutter had moved in with us. Small circular discs had been cut out of the leaflets and several pieces more oblong in shape had also been snipped out by this apartment builder. Later we discovered one place, a tiny opening in the stone foundation, where this small contractor had been working on a several-room project.

Each apartment built by the leaf-cutter is a thimble-shaped room made of the rose-leaf bits carefully fitted and glued together. This room is stored with bee bread made of pol-

len flour. The tiny egg is laid on this lump of food and the apartment is then sealed with a tiny round rose-leaf door.

The building instinct is strong and sure in all these little fellows who have condescended to put up with us in this valley retreat. Completely self-reliant, they waste no valuable wasp-hours in squabbling over the fact that Joe is carrying more pollen than he should or that the new DDT garden spray is unfair to organized stingers. Long ago they learned the folly of argument while time is running out. Their philosophy of life is based on the simple premise that the laborer is worthy of his hive.

I stood in the shaded woodland road while a hot September sun sent exploring fingers of shimmering light slanting downward through the tree-tops. Acorns kept dropping with suspicious regularity somewhere ahead, falling from the tall oak into the leafy carpet with resounding "splats." Chipmunks chirped all about me, warning the neighborhood that old Neb-nose was on the loose again, but the greedy squirrel in the oak kept right on snipping off his supper. I tried for a glimpse of him at work, but he was equal to the occasion and all I got was an ear-full of libelous abuse from his hidden sanctuary farther ahead.

Recent rains had remedied a severe drouth and the fern colonies had perked up to don their Sunday best. I walked out on a huge boulder whose graving chin was whiskered by a flourishing stubble of polypody fern. This is a spreading plant which has earned well its common name, "rock cap." In the loam by these rocks were three ghostly Indian pipes, "corpse plants" helping celebrate the death of another summer.

There was an occasional flash of orange flame in the timberland, showing where the drouth had hastened coloring of the sour gum. The countryman holds the tupelo in spe-



Penns. Game Comm. Photo

The fields and woods are filled with living things for people to see if they only look for them. The alert, beady-eyed chipmunk has brought forth more than one exclamation of amusement and delight from woodland travelers.

cial esteem. In Spring when it blooms the tiny flowers cast a perfumed sweetness that brings in all the bees in the countryside. And the robins find its blue-black berries loaded with special robin vitamins.

With the autumnal equinox again at hand, the countryman looks around and wonders where the Summer got to so quickly. Sometimes between the first bright goldenrod and the fallen leaves already yellowing, the Summer slipped away. Already the roadsides are wearing the first frosting of asters, sure sign that Fall is just around the corner.

Back on the opening roadway, I met a box turtle out for a September stroll. He was not the least bit shy and looked me over with his blood-red eye when I picked him up for in-

spection. While I was conferring with the turtle one of the little viceroy butterflies came along, settling on some asters so as to allow me a good look at the amazing accuracy with which he had mimicked the orange dress of the larger monarch.

There is method in this mimicry. The viceroy has discovered that birds will not attack the monarch butterfly. Perhaps the big fellow has absorbed too much of the acid juices of his food plant—the common milkweed—and the birds let him strictly alone. And so the little viceroy enjoys the same immunity, fluttering about in his false colors, working one of the neatest rackets in the butterfly business.

. . . : The End

# *Construction of a Field Roving Course*

By Thomas A. Forbes

## PART I

THE growing popularity of the field roving course is evidenced by the number of inquiries received on their construction. Field roving is a game and like golf there are certain standards which must be followed in the construction of a course to insure comparative scores and uniform classification of archers in accordance with their abilities. The National Field Archery Association has formulated certain basic requirements which must be met when a field course is constructed in order that the completed course will be officially sanctioned by the National Field Archery Association. This approval is given by the Secretary of the NFAA or his duly accredited representative. The officials of the club must submit affidavits to the Secretary of the NFAA that all measurements are correct and where approval of the Secretary of the National Field Archery Association is desired, such data as maps and photographs of the completed course must be submitted to the Secretary. In practice it is highly desirable that the members of a new club seek the advice of an experienced field roving archer in laying out their course. If possible the State representative of the National

Archery Association should be contacted and his advice solicited.

Proper planning in the selection of a site and the layout of the course will do much to insure the future success of the club.

The basic principles which should be followed in planning and constructing a field roving course are readily understood and with a working knowledge of these basic rules a course can be built which will be a pleasure to shoot and challenge to your ability as an archer.

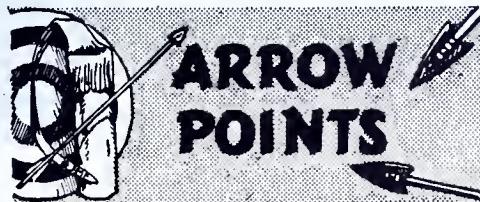
A standard field roving course consists of two units of fourteen targets each, a total of twenty-eight targets. This constitutes a round.

If space or other limitations prevent the construction of twenty-eight targets then a single unit of fourteen targets can be used and shooting twice around the unit constitutes a round.

### Selection of the Site

A plot of ground of at least ten acres is required for each unit of fourteen targets. Pennsylvanians are particularly favored in the type of terrain available in the Keystone state. Wooded hills and valleys are considered ideal for a course and terrain of this nature is available in almost all sections of the state. Along with the scenic beauty of the wooded countryside, the absence of brush and vegetation makes this type area a pleasure to shoot over.

Select a section of wooded land made up of rolling hills and valleys accessible by a good hard surfaced road within a reasonable driving dis-



tance from the community in which the club members reside. The nearer the site to the community, the better as its availability will permit shooting over it when only a limited amount of time is available. Small communities should be able to locate a site in the immediate country side; whereas those who reside in the larger cities may find it possible to make arrangements with the local officials to locate the course in an unused, woodland section of one of the public parks. If your choice is a public park and the authorities require that the course be open to the public. They can probably be induced to help finance the construction of the course.

If you locate a site on private property the owner should be contacted and a lease should be drawn with the owner for the use of the

site. There are many wooded sites which land owners would be willing to lease for a nominal sum of money provided they could be assured that they would not be held liable for accidents which might occur. To safeguard the owner and the individual members of the club liability insurance should be carried by the club.

In choosing a site give consideration to facilities for parking cars and for ample space in the central area where non-shooters of the family can picnic and enjoy the outdoors although they do not participate in the shoot. This central area might well be located at the site of a future club house and a fresh water supply is desirable. The course should be planned around the central area so that there will be no danger from stray arrows.



Penna. Game Comm. Photo  
*Scoring an event in a field roving competition.*

### Location of the Units

The best layout consists of two units of fourteen targets each. Targets numbered one, fourteen, fifteen, and twenty-eight should be located adjacent to the central area and archers should be able to travel to and from each of these targets from the central area without crossing the field of fire of any target on the course. It requires approximately two hours to shoot the full twenty-eight target field course and it may be desirable to return to the central area during this period. A sudden violent thunder shower, a broken piece of tackle etc., will necessitate returning to the central area. To avoid a long walk and the danger of cutting across the course such a layout is highly desirable. A standard unit is approximately six hundred yards in length and an added benefit is that during tournaments target assignments can be reached without a long walk and consequent positions is avoided.

With the locality of four of our target ranges and positions selected we are ready to reconnoiter and select the location for the remaining targets. These sites or ranges must be selected with the knowledge that contestants in a tournament will be progressing from target to target over trails in wooded areas. Therefore the first consideration is to insure the safety of contestants. This is accomplished in the same manner as that used in laying out a golf course. No trail should cross the range of another target, neither should it cross in back of another target. A trail, target, or shooting position should never be closer than forty feet to the line of fire to another target.

Arrows will miss the butt on numerous occasions and a background should be provided, clear of vegetation and so constructed or chosen that it will stop arrows but not break them or permit them to ricochet. Avoid placing a target on the brow or crest of a hill. Without a

back stop an arrow which misses the butt will pass over the crest in free flight endangering persons on the far slope and furthermore the chances of recovering the arrow are nil.

Breakage of arrows can be expensive. Have your background free from rocks and with no large trees directly in back of the target. If the ground is hard plow furrows at right angles to the line of flight and pile the dirt in ridges. When retrieving arrows walk in the furrows so that the soft earth ridges will be reserved for there intended purpose of stopping arrows without injury. The lost arrow like a lost golf ball can slow up the entire group of contestants, so keep in mind this fact and construct a cleared area in the immediate rear of each target.

### The Shooting Position

A shooting line at a single position shot should be at least ten feet in width with the shooting peg located in the center of the line. Field archers are generally assigned to targets in groups of four and at a single position shot it is customary for two of the group to take positions one on each side of the shooting peg immediately back of the shooting line and shoot at the same time. On shots of sixty yards or more the target should set in the middle of a clearing at least ten feet in width and this distance should be reduced gradually in front of the target to take care of the average undershot. Attention to these details which are common to all targets on the course will add to the pleasure in shooting a round. Such planning is especially necessary when the club is newly formed of beginners. Searching for lost arrows is not conducive to enjoyment of field roving shooting and since arrows are expensive, breakage and loss can be excessive if the layout is not wisely planned and constructed.

There is no precise guide for laying our your individual shots because there are no two pieces of terrain

that are identical. Certain yardages have been set as standards for the different sized targets and it becomes the duty of the members laying out the course to select the locale which will provide shots of the prescribed distances. A variation of five per cent on a shot is permitted if the terrain does not permit the full yardage. However the shortage must be made up on another shot in the same unit.

Before you actually begin your layout make several trips over the terrain weighing the values of the different topographical features against

the yardages required for the different shots and consider the ease with which trails can be constructed from each target to the next shooting position. Trails should provide a good footing and ascend and descend on easy grades so that they will be pleasure to traverse. Remember that your club will be composed of men of all ages, women and children that they have joined your club because they enjoy archery and are not interested in mountain climbing which is a sport in its own right.

. . . To Be Continued.

#### WHY HOG ALL THE FUN?

July 1 saw the beginning of woodchuck season.—An opportunity for the scope-mounted, high-power enthusiast or an advocate of the old single barrel 12 gauge, to get out for the first time in 1952 and "show his stuff". But why hog all the fun? There will be hundreds of young hunters taking to the fields this fall for the first time and some will be without any previous hunting experience. We all know that experience is the best teacher but experience with a time-seasoned teacher is far better than experience obtained alone. So why not take that young son or neighbor boy with you on your next quest for the woodchuck? By watching you and observing your caution before shooting, his impressionable mind can be shaped to where he will no longer be a greenhorn with a gun but a hunter already learned in the ways of firearms safety, woods lore, fairness to his fellow man and with a clearer understanding of wildlife conservation. District Game Protector Donald G. Day, Gelatt.

#### SUMMERTIME GUN PLEASURE

"Chuck hunting is a fascinating sport that brings pleasure to the sportsman and benefit to the farmer. It is one that is not to be taken lightly by even the expert rifleman, for it requires knowledge of habit and habitat, skills in stalking and marksmanship of the highest order. And 'chucks make for good eating, too, as many have discovered. Properly prepared, the meat of this alert little vegetarian is delicious."

"But there are other summertime shooting sports that provide pleasurable opportunities for valuable practice in marksmanship. Hand trap or target thrower, shooting will keep the shotgunner's eye in on every sort of wing shot. Here is a sport that requires little equipment . . . an inexpensive hand trap, a supply of 'clay' targets and your favorite upland game or wildfowling gun. A friend can throw the targets for you or you can throw them yourself. It is a sport for every member of the family who is old enough and able to handle a gun. Any type of wingshot can be thrown, from a high quartering target simulating duck or pheasant flight to a low whizzing grass-skimmer for the rabbit hunter. Turnabout in throwing-shooting may be taken and any number of competitive shooting games may be originated. Hand trap shooting is, indeed, a sport that will appeal to all gun-loving outdoorsmen."

"For the rifleman, 'plinking' offers unlimited opportunities for enjoyable practice."

"There are two booklets available free, which every gunner interested in off-season shooting should have. These are **MORE FUN WITH YOUR 22 RIFLE** and **HOW TO HAVE FUN WITH A HAND TRAP**. Either or both may be obtained for the asking by writing Advertising Division, Remington Arms Company, Inc., Bridgeport, Conn."



Photo by Author.

*Mrs. Clyde F. Barner, Jr., of South Williamsport and one of her many trophies.*

## MODERN DIANA HAS 13 DEER TO HER CREDIT

By William Boyd

**W**ITH 13 deer to her credit, more than half of them bucks, Mrs. Myrtle I. Barner, of 550 George Street, South Williamsport, is probably the most successful woman hunter in Pennsylvania.

In addition to her big game hunting success, Mrs. Barner, a 5-foot, 4-inch woman weighing 120 pounds, regularly hunts small game of all kinds and has shot everything but wild turkeys, game on which she now plans to concentrate.

"I'd much rather drop a wild turkey than a deer, for I've shot so many deer by this time I don't get the same thrill I once got when I made my kill," she says. "While it has been a thrill for me to kill a

deer, there hasn't been a time when I didn't dry my eyes after shooting one. I'm always overwhelmed by a feeling of sorrow and remorse."

A number of years ago Mrs. Barner got the buck with the widest spread of antlers of any shot in Lycoming County in that particular season.

"And that was the one year when I didn't have a membership in the Consolidated Sportsmen of Lycoming County and couldn't claim the prize offered for the nicest set of deer antlers," she laments.

Mrs. Barner hunts deer by herself and with parties, and has made kills under both conditions. Only once or twice while hunting near the Barners' summer place in a remote part of Sullivan County has she dragged her deer in. Usually there have been male hunters within hailing

distance who gave her a hand with this strenuous part of deer hunting.

Men with whom she hunts know full well she's a skillful deer hunter and obey her orders without hesitation when she places watchers and directs drivers.

"I've made it my business to study the terrain and the habits of animals in our favorite hunting territory in Sullivan County," she explains, "so I know quite well where the drivers must move to rout out deer and I know, too, where the deer are likely to cross and where watchers are most likely to get shooting."

Mrs. Barner was brought up on a farm between Roaring Branch and Liberty, in Tioga County, and was taught to shoot by her father. But she never did any hunting until she married Clyde F. Barner, Jr. Ever since then they have hunted and fished together both in Pennsylvania and Canada.

Oddly enough, this woman who handles a rifle and shotgun with a skill surpassed by few men is a twin whose sister neither hunts nor fishes but prefers to spend her vacation at the seashore or in big cities.

"So far as tastes and enjoyments are concerned, we are as far apart as the poles," explains Mrs. Barner in speaking of her twin sister.

Interested as she is in outdoor sports it is perhaps only natural that Mrs. Barner finally tried her hand at trapping. It was choice raw material in her own back yard which gave her the trapping urge, and now she is well on the way to having a new fur coat.

Back of the Sullivan County farm house which the Barners have converted into a comfortable lodge is a swamp area where beavers have created ponds by building dams.

Mr. Barner permitted the beavers to carry on their dam-building activities unmolested until the beavers' food supply became so limited there was probability of the beavers moving to a place where food was more plentiful.

His wife wanted the beavers to remain in her back yard and reasoned they'd do this if their numbers weren't too great for the available food supply. Then it came to her she might be able to get rid of the surplus beavers and at the same time procure a fine fur coat for herself.

She wasn't discouraged when the game warden told her it was difficult for even an experienced trapper to catch beaver, and in the beaver trapping season recently ended she set traps under the ice of the pond back of the beaver dams.

It was only a few mornings later that she found a huge beaver caught by his foot in one of her traps. She confesses she was so nervous and excited she couldn't hit him in the head with her revolver bullets and had to resort to her small calibre rifle to kill him. And the fur coat appeared quite a bit nearer when she learned her trapped animal weighed 51 pounds.

The next morning she found a second beaver in another trap, this one a 42-pounder.

Now, furriers tell her, she needs but five more beavers of comparable size to have sufficient raw material for the beaver coat she envisions.

Mrs. Barner is also a familiar figure along the trout and bass streams of North-Central Pennsylvania and is as skillful with a rod and line as she is with firearms. It is seldom, indeed, her creel doesn't have as many fish as her husband's when they return from a fishing trip.

. . . *The End*





## MEMORIAL TO DR. KILGUS

On June 1, 1952 a memorial was dedicated to the memory of the late Dr. H. E. Kilgus, widely known conservationist and civic leader, who died November 12, 1949 while serving as a member of the Pennsylvania Game Commission. The memorial consists of three stones taken from a gristmill operated more than 100 years ago at Richardsville. The stones symbolize outstanding achievements in the wildlife conservation field: one represents plans formulated by John M. Phillips and Hiram Frost for the restoration of the deer herd in Toby Valley; one symbolizes the planning for education in conservation brought about by Richard E.

Reitz and Meredith Marshall; one stands for the plan of restoring the wild turkey formulated by the late Dr. Kilgus.

At the dedication services John Herman, vice-president of the Game Commission, delivered the principal address, and James Hysong, supervising principal of the Brockway-Snyder-Washington Schools served as master of ceremonies.

Dr. Kilgus served as a Commissioner from July 22, 1943 until his death, and will be remembered as an active leader in conservation circles. His service in religion, business and civic activities was unsurpassed.

## SPECIAL ARCHERY SEASON FOR DEER—REQUIREMENTS

### CONDITIONS WHEN REQUIRED

A Resident or Nonresident Hunting License and a Special Archery License or Archery Preserve Permit are required by *each person* (no exceptions) to hunt for male deer with two or more points to one antler with bow and arrow during the state-wide bow and arrow season October 13th to October 25th, 1952, both dates inclusive. The Special Archery License or Archery Preserve Permit also entitles the holder thereof to hunt for and take game of any kind with bow and arrow during the lawful open season on the two Special Archery Preserves located in Forest and Sullivan Counties.

### CONDITIONS WHEN NOT REQUIRED

*Except as Above Defined*, bow and arrow hunters require only a current Resident or Nonresident Hunting License to hunt for small game, bear or deer, during the lawful open season for such species of game. However, before anyone may hunt for antlerless deer during any special season declared by the Pennsylvania Game Commission, such person must also purchase an Antlerless Deer License at a fee of \$1.15, unless permitted by law to hunt without a license on land resided upon or immediately adjacent thereto with the written permission of the owner or occupant.

## HUNTERS!!

### Antlerless Deer Information

Under the amended provisions of the Game Law, Antlerless Deer Licenses may be secured *only* from the County Treasurer of the county for which the license is desired. Such licenses *cannot* be secured from the Department of Revenue, Harrisburg.

*Commonwealth of Pennsylvania  
Department of Revenue  
Harrisburg*

## NWF Establishes Scholarships

The National Wildlife Federation has announced four grants of \$1000 each for college fellowships in advance conservation training or research. Designated as "J. N. (Ding) Darling Fellowship" in honor of the famous newspaper cartoonist and conservation leader who organized the Wildlife Federation in 1936, the 1952 grants went to the following institutions:

Long Beach State College of California—For research expected to come up with a practical program of conservation education for city school children.

Cornell University—Research into and demonstration of tape recordings as a medium of conservation education.

Boston University—Graduate study of the organization and aims of conservation education.

University of Wyoming—Development of instructional units for teaching conservation in high schools.

The Long Beach and Cornell grants are renewals of fellowships established in 1951. The Boston and Wyoming studies are new, according to Dr. Walter P. Taylor of Claremont, Calif., chairman of the Federation's committee on conservation education.

The Federation also is supporting a fellowship at the University of Oklahoma granted last year for the

purpose of equipping a journalist or public-relations expert with specialized training in wildlife management.

The fellowship grants, like other activities of the National Wildlife Federation, are financed through the distribution of Wildlife Conservation Stamps. In return for stamp—color reproductions of paintings by leading nature artists—several hundred thousand individuals make small contributions annually.

## Rail, Gallinule, Dove Seasons Set

Last week, Albert M. Day, Director of the Fish and Wildlife Service apprised Game Commission authorities of these season regulations for Pennsylvania.

This year's season on rails and gallinules will be the same as that of 1951—September 1 to October 30, both dates inclusive. The daily bag remains at 15, the possession limit 15.

The dove season for '52 will begin September 15 to October 14, inclusive, about 3 weeks earlier than in '51. The daily and possession limit for doves remains at 8 and 8.

Detailed regulations for migratory waterfowl and woodcock hunting will not be issued until the latter part of August, federal officials said.



Photo by Kenneth Bolich

Kenneth Bolich, Orwigsburg, rescued this armored groundhog and photographed it before removing the tin can from the animal's head,

# Planning the Trapline

By L. J. Kopp

**P**UTTING the trapline in working order requires some serious and sound planning, for success or failure is largely determined by the thought you devote to laying out your line.

This is not so complicated when we recognize that there is more than one method of trapping. For instance there is the group trapper who sets his traps in a limited area and makes his daily rounds on foot. Then there is the line trapper who operates a long line of traps with an automobile. The full time trapper usually operates several such extensive traplines alternately in one season.

There are a number of important factors to be considered in planning a trapline. Such matters as knowledge of animal habits, game laws, expenses, available time, and others determine the most practical type trapline.

A fair knowledge of animal habits is perhaps the most important, and a small group-trapping venture will give the newcomer more invaluable information of this kind than all the books in the world. You would not expect to enter high school as a Junior, but rather as a Freshman. Similarly, you should not expect to enter trapping as a long line trapper, but as a group trapper, graduating into long line trapping, and on to several lines as your experience progresses.

A group trapline is usually laid out in a rough circle so as to avoid unnecessary walking. The distance covered might be anywhere from one mile up to ten or more, the length of your trapline depending on how much you expect to devote to trapping each day.

Many novice trappers who tend their traps before and/or after school hours might operate a trapline up to four miles in length. Other group trappers might operate a trapline of ten miles or more. The main thing is to plan such a trapline in accordance with available time or the number of traps which you use. How many traps to use depends upon two things—the abundance of animal signs and the amount of money you wish to invest in equipment.

While many group trappers today are influenced by fur prices, it is generally a better policy to trap for all legal animals found in your trapping area. Expenses involved in such small scale trapping are negligible. The initial cost of traps might be considered high, but with the exception of any traps which may be lost or stolen these tools of the trapper's trade will give good service for many years.

Depreciation is inevitable, but of little consequence.

Compared to long line trapping with an automobile, there is practically no expense involved in what I have termed group trapping. In planning a trapline of the former type transportation costs must be taken into consideration, particularly on an extensive line.

In operating such a trapline, special attention is focused on the time element and the expenses involved.



To assure reasonable success, a sound knowledge of animal habits is essential—a necessity in locating good trap sites with little difficulty even in unfamiliar territory. This is important, since your time for experimenting is limited.

The first thing to decide is the amount of time you wish to devote to trapping each day and the type of trapping you want to do, i.e. whether you desire to trap for all legal animals in the area, or whether you prefer to specialize in one specific animal.

In my opinion a fifty-mile trapline would be about right should you decide to specialize in fox trapping. However, if you should prefer to trap for all legal animals, a twenty-five to thirty-mile trapline would be more practical. Naturally this depends a great deal upon the country and its animal population.

Naturally we want to be efficient and avoid as much wasted time as possible, so we keep an eye open for short cuts. As in group trapping, the main point is to have your trapline laid out in a circle so that the various roads and highways which you travel form a continuous line. Sets that are located far off the main travel route should be held to a minimum. Very often, however, such spur lines lead to excellent sets, and in such instances the trapper must decide whether or not they are worth the time and gasoline expended.

Driving or walking along old logging or other little-used roads during the summer is in itself a highly interesting pastime, but even better is the fact that you will frequently find

that these roads lead to short cuts which may be utilized during the trapping season. I have spent hours along old mountain roads removing fallen branches, trees, etc., in order to clear the road for use as short cuts on my trapline. Indeed, there is nothing more satisfying than such a road covered with brightly colored leaves during late October and following them on the fox 'line adding immeasurable pleasure to the trapping routine.

After securing permission from landowners, private roads and lanes sometimes offer short cuts across fields or woodlands. Time spent in hunting for and following such old and little-used roads is time well spent, if you want to cover the best trapping spots in the least possible time. On various occasions I have found binoculars useful in spotting roadways and examining trap sites which otherwise would have been hidden from view.

Some trappers plan several long auto traplines, and run them alternately. One line might be operated for two or three weeks, then the traps moved to the second one. Then too, there are trappers who operate one of their lines one season and the other one the next season.

At any rate a little pre-season planning will pay big dividends in trapping efficiency. An overlong line, an excess of unproductive sets or a route involving too much backtrapping can make a chore out of what should be a pleasant pastime.

. . . *The End*

Christmas is just around the corner and the women folks will be scratching their heads about what to get for pop or the boys. Let us solve that problem. Just send us \$1.00 for a year's subscription to this magazine and your worries will be over. The GAME NEWS is a nice gift for anybody to give to anybody.



### The Masked Bandit

PUNXSUTAWNEY, Jefferson Co.—During the corn planting season of this past spring I received a complaint from a farmer to the effect that some type of wildlife was taking or destroying a large amount of the seed corn he had planted. Naturally my first thought was crows or possibly pheasants, but the farmer thought otherwise as the corn had not yet started to come through the ground. As an experiment to relieve this great damage, I set three steel traps at different locations across the field and within the next two nights two large raccoons were trapped and the damage ceased at once. In all my experience this is the first time that I have actually known that raccoons could locate corn in the ground and would systematically take it grain by grain. I believe this had happened many times in the past, with the crows and pheasants receiving the blame. District Game Protector Howard F. Hoffman, Punxsutawney.

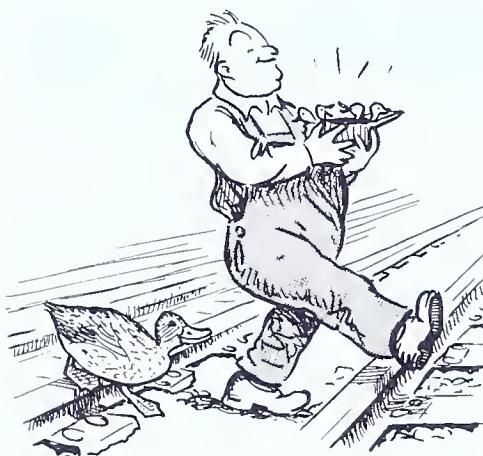
### Predators Living Good

CANTON, Bradford Co.—Predators on State Game Lands No. 12 seem to have gone on a grouse diet. Last week I killed two Cooper's hawks that were feeding on grouse and a red fox that was carrying two young grouse into a den. District Game Protector Duane E. Lettie, Canton.

### Hawk Goes Berserk

HARRISVILLE, Butler Co.—Deputy James Parnham of Harrisville related the following story to me. Dalton Baker age 12, residing near Harrisville was riding his pony in the woods near their farm. A red-tailed hawk attacked the boy knocking him off the pony. He tried to protect his face with his hands, however, the hawk got its talons in one of his hands. After quite a struggle the boy subdued the hawk, although, he was suffering from three punctures in his hand. District Game Protector Woodrow E. Portzline, Slippery Rock.





### Stop, Look And Listen!

SUMMERDALE, Cumberland Co.—A dispatcher for the Pennsylvania Railroad Company in the Enola Freight yards, told me of an interesting experience that occurred at his work.

A wild mallard duck hen hatched out a brood of eight young along a bank at Summerdale, near a culvert that goes all the way to the river under thirty-five railroad tracks.

About 11:00 a. m. one day in June a brakeman in the yards saw the mother duck leading her brood towards the river halfway across the thirty-five tracks. She would go slowly and they would toddle after her. Sometime some of them would sit on her back and ride for a while. This was a very difficult job because at times cars would be shifting back and forth on one track or another.

Mr. Dorman decided he would give this courageous mother a "lift", so he put the little ducklings into his cap and carried them to the river. The mother duck followed him, with an air of gratefulness. Mr. Dorman reports that they were dropping cars over the hump and he had to exercise care on this trip. The mamma duck seemed to sense the difficulty and she, too, was very careful to follow at the right time. Finally they reached the water's edge. Mr. Dor-

man took the ducklings from his cap and placed them in the water where she happily and gratefully took charge of the brood. Asst. to Executive Director Wilbur M. Cramer, Harrisburg.

### Clever Killer

BEDFORD, Bedford Co.—A local farmer cultivating corn, noticed a crow flying from an adjoining field carrying something. Soon the bird returned and the farmer drove the tractor near the fence to investigate. He saw the crow on the ground and a rabbit chasing the crow. The crow would move away ten to fifteen feet and the rabbit would run towards the crow. When the rabbit and the crow were out in the field some distance, the bird flew back over the rabbit about 100 feet and picked up a young rabbit from the nest and flew to the nearby woods. District Game Protector E. M. Woodward, Bedford.

### Neighborhood Bully

EAST RUSH, Susquehanna Co.—On the Charles LaRue farm near East Rush there is a male ringneck that has made quite a pest of himself. The children are afraid to go into the fields because he flogs them and he attacks the men operating tractor near there. Every day someone catches the bird and throws him into the air just so he will fly to another field but he invariably returns within an hour. District Game Protector James W. Clouser, Montrose.



### Wrong Address

MONTOURSVILLE, Lycoming Co.—On June 23, while touring the State Wild Turkey Farm, I saw an unusual sight. Observed a wren flying into a cliff swallow's nest with a worm in its mouth. The great mystery is, was this wren feeding her young or the young of the cliff swallow? Student Officer Alex J. Ziros, Ross Leffler School of Conservation.

### Snake Sabotages Propagation Effort

MONTOURSVILLE, Lycoming Co.—While on a recent field trip to the Loyalsock Game Farm, I was told that a few days previous to my visit a large black snake was found in the act of devouring a half grown rabbit. This action took place adjacent to one of the brooder fields. The rabbit was about half devoured at the time it was discovered, and it made no effort to release the rabbit or flee. This once again proves that all black snakes are not always beneficial. Student Officer William E. Fulmer, Ross Leffler School of Conservation.

### Mulberries As Game Food

BLAIN, Perry Co.—Mulberry time is here again, and along with it comes many interesting sights. Deer, grouse, and gray squirrels come to within twenty-five feet of our house to eat the mulberries. As many as four deer have been observed at one time, including one that had its rear leg broken (but nature had done an excellent job mending it). There is a tree of white and one of red mulberries. The deer far greater prefer the white ones while the grouse and squirrels prefer the red ones. District Game Protector Harold E. Russell, Blain.

\* \* \*

A newborn bear cub is smaller than a newborn baby porcupine.

### Deer Out Of Nowhere

AVOCA, Luzerne Co.—Each year following the doe season many persons protest that the deer herd has been practically wiped out. This year has been no exception. Many persons stated that there were very few deer left in this area. However, if the number of deer damage complaints is any basis for comparison, the deer herd is holding its own very well. To date the deer damage complaints have been much more numerous than they were last year. District Game Protector Stephen A. Kish, Avoca.

### Come On Thanksgiving!

LAPORTE, Sullivan Co.—While on patrol through various parts of the District I have observed several good flocks of young turkeys and had reports of others observed by different people. The early prospects for beech and cherry in this district are very good. Unless something unforeseen happens to these crops, the wild turkeys observed should be fat and very desirable trophies in the next hunting season and a tasty dish at that Thanksgiving feast. District Game Protector Robert K. Benscoter, Laporte.

### Rabbits Thriving In Border Cutting

TUNKHANNOCK, Wyoming Co.—It apparently has been a very good nesting season for our small game animals and birds in Wyoming County. The new crop of young rabbits seems to be especially good in this area, particularly in the "clean farming" sections now served by our woodland border cuttings where once good rabbit cover and rabbits were very scarce. District Game Protector Richard R. Roth, Tunkhannock.

\* \* \*

While some animals are able to glide and even soar, the bat is the only animal that can really fly.



Photo by Altoona Mirror

## *Picture Story*

### NOW IS THE TIME TO GET READY FOR WINTER

A large group of sportsmen, in cooperation with representatives of the State Game and Fish Commissions, feed squirrels, deer and turkeys during the winter months. Some go to the woods of Blair and Huntingdon Counties on Sunday afternoons to build and stock shelters.

At the right they are placing evergreen boughs on the top to protect the corn against rain and snow. Note that the floor of the shelter is well above the ground. Deer and squirrels have no trouble getting the corn while turkeys do their feeding below, surviving on dropping grains.





Photo by Delbert Batcheler.

The Game Commission is helping to restore waterfowl by raising and liberating mallard ducks 5 to 7 weeks of age. Above is part of this year's crop of more than 2500 ducklings which have been released in suitable water and marsh areas throughout the Commonwealth.

Pennsylvania State Archery Association to hold annual Field Championship Tournament in Reading, Pennsylvania, September 20 and 21. The event will be held on the range of the Reading Archery Club located on the mountain known as the Pagoda Mountain, in Reading. Shooting starts at 12 noon Saturday and continues through Sunday with a public demonstration planned at 3 p. m. Sunday. Further information can be obtained by writing to Clayton B. Shenk, P. O. Box 1294, Lancaster, Pennsylvania.

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# Pennsylvania Official 1952 Open Seasons and Bag Limits

Open season includes first and last dates listed, Sundays excepted, for game.\* The open hour for small game on November 1, buck hunting on December 1, and antlerless deer hunting on December 15 will be 9:00 A. M. Otherwise, upland game shooting hours daily are from 7 A. M. to 5:00 P. M., but from July 1 to September 30 inclusive, 6:00 A. M. to 7:30 P. M. (All shooting hours based on Eastern Standard Time.)

	BAG LIMITS	OPEN SEASONS
	Day Seasons	First Day Last Day
<b>UPLAND GAME</b> (Small game possession limits below)		
Bobwhite Quail .....	4 ..... 12 .....	Nov. 1 ..... Nov. 15
Ruffed Grouse .....	2 ..... 6 .....	Nov. 1 ..... Nov. 29
Wild Turkeys (see counties closed below)* .....	1 ..... 1 .....	Nov. 1 ..... Nov. 29
Ringneck Pheasants, males only .....	2 ..... 8 .....	Nov. 1 ..... Nov. 29
Rabbits, Cottontail .....	4 ..... 20 .....	Nov. 1 ..... Nov. 29
Squirrels, Gray, Black & Fox (combined) .....	5 ..... 20 .....	Nov. 1 ..... Nov. 29
Squirrels, Red (closed October only) .....	Unlimited .....	All mos. except Oct.
Hares (Snowshoe Rabbits) .....	2 ..... 6 .....	Jan. 1 ..... Jan. 10,
Raccoons, by individual or hunting party* .....	5 ..... } 40 .....	Oct. 15 ..... Feb. 1, '53
Raccoons, by trapping* .....	5 ..... } 40 .....	Oct. 15 ..... Feb. 1, '53
Woodchucks (Groundhogs) (closed October only) .....	Unlimited .....	All mos. except Oct.
Grackles (unprotected) .....	Unlimited .....	Unprot. to Sept. 1, '53
Bears, over one year, by individual .....	1 ..... 1 .....	Nov. 17 ..... Nov. 22
Bears, as above, by hunting party of three or more .....	2 ..... 2 .....	Nov. 17 ..... Nov. 22
<b>DEER:</b> <b>Bow and Arrow Season</b> —Male with two or more points to one antler (requires hunting license and special archery license) by individual* .....		Oct. 13 ..... Oct. 25
<b>Regular Season</b> —Male with two or more points to one antler, by individual* .....	1 ..... 1 .....	Dec. 1 ..... Dec. 13
<b>Antlerless Season</b> —(requires hunting license and antlerless deer license) by individual* .....		Dec. 15 ..... Dec. 17

**NO OPEN SEASON**—(Hen Pheasants, Hungarian Partridges, Cub Bears, Elk, Spike Bucks and Otter)

## FURBEARERS:

Skunks and Opossums .....	Unlimited .....	Unprot. to Sept. 1, '53
Minks .....	Unlimited .....	Nov. 5 ..... Dec. 15
Muskrats .....	Unlimited .....	Nov. 29 ..... Jan. 15, '53
Beavers (traps only), state-wide* .....	3 ..... 3 .....	Feb. 16 ..... Mar. 7, '53

## \* SPECIAL REGULATIONS

**POSSESSION AND TRANSPORTATION LIMITS** of legally-killed small game shall mean not more than the daily limit for the first day nor more than an accumulated total for each succeeding day of the open season for each species; but not in excess of the season limit, regardless where held, stored or found in possession.

**TURKEYS, COUNTIES CLOSED TO HUNTING**—Adams, Armstrong, Butler, Fayette, Greene, Mercer, Somerset, Venango, Westmoreland and York. In addition, that part of Cambria west Highway Routes Nos. 271 and 56; that part of Cumberland south of U. S. Highway Route No. 22 to the west shore of the Susquehanna River; and that part of Franklin south and east U. S. Highway Route No. 11 are closed.

**RACCOONS**—Hunting season begins at 7 A. M. on the first day, and ends at noon on last day (see instructions below concerning trapping). May be hunted day or night, Sundays except. The season limit applies to hunting and trapping combined.

**DEER**—Even though there are three separate seasons for taking deer, a hunter may not kill more than one deer during the three combined 1952 seasons, whether hunting individually or with a camp or hunting party. A Special Archery License is required during Bow and Arrow Season issued only by the Dept. of Revenue, Harrisburg, at a fee of \$2.00. Antlerless Deer Licenses are issued only by County Treasurers, at a fee of \$1.15, and valid only in the County for which issued. Farm occupants permitted by law to hunt without a license may also hunt for antlerless deer during the antlerless season on the same lands as for other game. See Digest issued with hunting license for details. Under the law, no application for an Antlerless Deer License shall be approved, or license issued, to a Nonresident prior to November 15, or after December 14, 1952.

**BEAVERS**—No trapping at Commission-posted dams. Nonresidents may not trap beavers. One person may set, tend or operate 10 traps only. Traps must not be set on the structure of a beaver dam or house, or within 25 feet of the waterline on the structure of either thereof. Tags must be kept above ice or waterline to facilitate identification without disturbing traps. Pelts must be tagged within 10 days after season, and may not be sold or otherwise disposed of until properly tagged. Present them to the Game Protector in District or County where trapped.

**TRAPPING**—Traps for furbearers and raccoons not to be placed, staked or set before 7 A. M. on the first day of the open seasons. The season indicated for Trapping closes at 12:00 o'clock Noon on last day. Traps must be tagged with metal name tags.

**SNARES**—The use of snares is prohibited in all counties except by special permit.

REGULATIONS FOR UPLAND GAME FIXED BY PENNA. GAME COMMISSION  
AT MEETING JULY 1, 1952.

1952 HUNTING LICENSE IS VALID SEPT. 1, 1952 TO AUG. 31, 1953, BOTH DATES INCLUSIVE.

PENNSYLVANIA

# Game News

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SPECIAL ISSUE NO. 5

# TO THE HUNTERS OF PENNSYLVANIA

**P**RÉDATOR control is big business in Pennsylvania. Since 1915, at least \$5,000,000 of the sportsmen's money has been spent in an effort to produce greater game crops by destroying predatory animals.

Today, many of Pennsylvania's hunters believe that more intensive control is desirable. They are demanding that a determined effort be made to kill even greater numbers of these animals and are convinced that "the only good hawk is a dead hawk."

But wildlife management is a science, and predators form an important part of the wild life of the state. Therefore, it is the responsibility of the Pennsylvania Game Commission to consider predators and predator control from a strictly scientific viewpoint. They are obligated to study the relationships between predators and their prey and attempt to determine the destructive or beneficial qualities. From these studies, they must decide whether control is needed and, if so, where it should begin and where it should end.

The following pages contain a revised report of the findings of some of these research studies. It is believed that the sportsmen of Pennsylvania will welcome the opportunity to make their own independent decisions concerning predators and predator control. For this reason, all specific recommendations have been deleted. It is hoped that the readers will discover that all predators are not bad; that predator control does not always result in increased game populations; and that sometimes predators can actually improve hunting.

Here are the pros and cons of the question, and the information necessary to settle many arguments at the club or hunting camp. Here is an opportunity for the hunters of Pennsylvania to decide whether their license money should be spent for intensive predator control or for other game management methods which may have a greater benefit in the long run.

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Commonwealth of Pennsylvania

JOHN S. FINE, GOVERNOR



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Special Issue No. 5

The Predator Question  
By Roger M. Latham

Taken from Final Report II  
Pittman-Robertson Project 36-R

The Ecology and Economics of  
Predator Management

*Cover painting by Ned Smith*



PENNSYLVANIA GAME NEWS

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ED SMITH

**RED FOX**

# THE PREDATOR QUESTION

By ROGER M. LATHAM

Taken from Final Report II  
Pittman-Robertson Project 36-R

*The Ecology and Economics of Predator Management*



PUBLISHED BY THE  
PENNSYLVANIA GAME COMMISSION  
Harrisburg

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## Preface

Pennsylvania has paid bounties on one or more presumably noxious animals constantly since 1683. Beginning in 1913, all money paid for bounties by the state has originated from the Game Fund—the revenue received from the sale of hunting licenses. In 1915, the obligation for these payments was transferred from the County Treasurers of the respective counties to a central office in Harrisburg. During the period from 1915 to 1952, the Pennsylvania Game Commission has expended \$3,706,457.50 for the control of predaceous birds and mammals as a function of game management.

Because the Pennsylvania system of controlling predators has been under attack for so long by at least two factions—by those who may be classified as nature lovers or protectionists, and by many trained economic biologists and ecologists who repeatedly point out its many faults and shortcomings, the Pennsylvania Game Commission wisely instituted a program of intensive studies of predator-prey relationships. When these studies have been completed and the findings reported, it is the intent of the Commission to review all of its present practices and policies in regard to the various predators and their management and make adjustments accordingly. Thus, it is hoped that in the near future predator management in the state will be based upon carefully interpreted studies of the complex interrelationships of predators and their prey to man's interests, and all possible benefits or harmful effects from the protection, or control, of any species or individuals of any species will be considered.

As a preliminary step toward these intensive studies and as a guide for the research biologists who will be assigned to the problem, it was decided (1) to amass all of the available food habits figures for predatory animals common to the fourteen northeastern states and (2) to analyze, from a search of the literature, the present concepts concerning predators, predator control, and predator control methods.

This is *Report II* of the two-part study (Report I is entitled, "Food of Predaceous

Animals in Northeastern United States). Because of the highly controversial nature of the subject, the writer did not feel qualified to decide between right and wrong on the various questions presented. Perhaps there is no right and no wrong in some cases, and perhaps the factions which have argued and haggled over a point year after year are both wrong in the final analysis. Therefore, where there are differing schools of thought, both sides have been presented with as little prejudice as possible.

Vocationally, the writer is employed by the Pennsylvania Game Commission and thinks and works as a practical game manager; avocationally, he is a hunter and fisherman and thinks and acts as a sportsman; and sentimentally, he is a nature lover-seeking beauty in all living things and delighting in their existence. It is hoped that the discussion, based upon an interpretation of the literature and personal experience, will reflect an open mind and an unbiased approach. However, it must be remembered that the basic purpose of the study was to investigate the relationships between predators and valuable wildlife (principally game) and to review the present knowledge concerning the advisability of predator control and the economics of the various predator control methods.

It is hoped that this report will stimulate additional and much-needed research. What is the true ecology and the true economy of predation? Are predator and prey mutually dependent? Are we wasting millions of dollars for predator control, or should our efforts and expenditures be even further increased? Should we adopt the "balance of nature" concept and allow our wildlife to adjust itself naturally, or should we manage our game and furbearers as intensively as we manage our farm crops or domestic livestock? There are thousands of questions yet unanswered. Only research can fill the gaps in our knowledge, and, until these are filled, predator management and its place in wildlife conservation will remain an enigmatic function characterized by blind gropings and clumsy blunderings.



SPARROW HAWK

**PART I**

# *Predator Food Habits Studies*

## **INTRODUCTION**

UNTIL the pioneer studies of Warren (1890) and Fisher (1893), almost nothing was known of the food habits of the various predatory species. Prior to these studies the supposed harmful, neutral, or beneficial nature of an animal's feeding behavior was based almost entirely upon scattered observations. Because there was seldom an instance wherein someone had not observed some individual of almost every predatory species in an act contrary to man's interests, and because no one could state definitely how many times members of a certain species might have repeated a similar misdeed, all predators were condemned and subjected to some degree of control.

Quantitative analyses of stomach contents, fecal droppings, and regurgitated pellets provided something reasonably concrete for ecologists and economic biologists to evaluate the status of the carnivorous animals. Within a short time, certain groups were calling for a cessation of the constant persecution of various birds and mammals which had been, according to them, proven beneficial or harmless by the analytic studies of Warren and Fisher. Even among game men, there was a growing doubt in many minds that blanket control of *all* predators was a desirable practice to increase game populations. As a consequence, food habits research was stimulated in all parts of the country.

For the following three or four decades the economic status of predatory species was based almost solely upon the result of these examinations. If the diet of a particular bird of prey or carnivorous mammal

showed a preponderance of desirable or useful prey species, then the animal in question was classified as harmful and was black-listed by game managers. Little or no cognizance was taken of such factors as the relative density of predator and prey populations, the food preferences of the predator, the physical condition of the prey, the amount and location of escape cover, and the abundance and availability of "buffer" species.

During the past 20 to 25 years, greater emphasis has been placed upon the end result of predation—its total effect upon prey populations and upon man's economy—instead of upon the fact that a definite percentage of the diet was composed of a particular prey species. At present, it is fairly well agreed among professional wildlife workers that *food habits figures for predators have comparatively little significance unless accompanied by specific ecological data from the region where the stomachs, scats, or pellets were collected.* In other words, it is almost impossible to evaluate the economic status of a flesh-eating animal from food habits figures alone. The proper interpretation of the occurrence of a prey species in the diet of a predator may have as much significance as its correct identification in food samples in the first place.

Game administrators, agriculturalists, and livestock raisers are inclined to classify predatory animals according to the amount of good or harm they may do in relation to their particular interests. In the past this classification has been derived from an evaluation of food habits tables

which often represented only a few food sample analyses or sight records. The subsequent discussion will deal with the problems which arise when an attempt is made to designate the

true role of a predator as it affects the economy of one group or another from the interpretation of food habits figures alone.

## PROBLEMS ENCOUNTERED IN ATTEMPTING TO EVALUATE THE ECONOMIC STATUS OF A PREDATORY SPECIES FROM FOOD HABITS STUDIES

### Sampling

#### Inadequate Number of Analyses or Observations

THE meaning here should be fairly obvious. Suppose, as often has been done, only 30 or 40 stomachs of red-tailed hawks, or of some other predatory species, are analyzed for a region, and its good or bad qualities assumed from this study. During a greater part of the year, hawks appear to have two major periods of activity daily, although they will overlook few opportunities to feed at any time. For sake of discussion, let us assume that red-tailed hawks, on the average, eat two meals daily. Because digestion is rapid, and because pellets are regurgitated, we may further assume that new food is represented in the stomach each day. Then in a year's time, the stomachs of the 30 redtails mentioned above could contain a total of 10,950 separate collections of food items. Of these 10,950 possible samples, only 30 have been analyzed—less than three-tenths of one per cent. This is hardly adequate sampling!

Similarly, a few dozen scats or pellets may, under certain circumstances, give a distorted picture of the true dietary tendencies of the animal, although scats may often contain the remnants of food items consumed over a period of two or three days. The same logic will apply to observations made at dens and nests where food materials are brought to feed the young.

Thus, it can be seen that limited sampling may be misleading and result in an erroneous designation of the economic status of a predatory species.

Observational studies of food remains at mammal dens and raptor nests are indicative of feeding trends, but the smaller prey items, which often may be swallowed whole, will not appear among the residue. By collecting and analyzing the scats or pellets of the young animals, this deficit may be partially corrected.

### Faulty Techniques

(1) *Lack of skill or thoroughness of analyst.* If a technician presents a food habits table showing no unidentified materials, he is either exceedingly skilled, is working with a very simple diet, or is dishonest. But some analysts have an excessively long list of unidentified items, and there is always the possibility that, if the identity of some or all of these were known, the predator's economic position might be considerably altered. This would be particularly true if the unknown items happened to be nearly all the same. For example, quite often the great majority of the birds taken by barn owls are starlings and English sparrows, both of which are usually considered pest species. The finding of house sparrows and starlings, in its pellets would contribute to the "credit" side of the owl's diet, but, if these were

not identified to species, it is likely that they would be charged against the owls since small birds, as a group, are usually considered beneficial. Many more examples could be cited to show that identification of food items should be as complete and specific as possible.

Mis-identification is likely to be even more serious than lack of identification since this could mean a transfer of items from the "debit" side to the "credit" side, or vice versa. There is no need to dwell upon a situation so obviously undesirable.

#### Incomplete Representation of Diet in Stomachs, Scats, and Pellets

Ordinarily, the items occurring in stomach contents are fairly readily identifiable at least to class and most often to genus or species. Because of the freshness of the material and its ease of identification, stomach analysis would appear to offer the most complete record of the animal diet, but even this method does not reveal the number and kinds of prey killed but not eaten. In the case of some carnivores, the numbers of prey animals killed may be several times as large as the number represented in stomachs or scats. Foxes, minks, weasels, and others are known to kill many (even one, two, or more hundreds in a single night) penned chickens, ducks, ringnecked pheasants, or other birds. A night's carnage of this sort probably would show only as one chicken, one duck, or one pheasant in the stomach. Foxes, coyotes, and other mammals are known to kill several rabbits, pheasants, or other prey in a single night of opportune hunting and to cache most of these, in their entirety, for possible future use.

Some prey species may be killed regularly and discarded uneaten. Foxes seem to have an aversion to the taste or the odor of weasels, moles, and shrews. It may be significant that a pronounced scarcity of

weasels coincided with the recent irruption of foxes in Pennsylvania, but, even though foxes may have been responsible for this reduction, very few weasels would appear in fox stomachs collected during this period. This is only a single instance of many possible ones where predator-prey relationships would not be revealed by food habits figures.

Digestion of certain food materials is so complete that recognizable remains cannot be found in fecal samples and pellets. The digestion of very young nestlings of altricial birds and the naked soft-boned young of rabbits, mice, and many other small mammals is usually so complete that no suggestive trace can be found. Other remains, e.g., the shafts and quills of feathers are only identifiable as birds of certain size groups.

If food samples are examined only superficially, as much as one-third to one-half of the total number of items occurring in the samples may be missed. Such hasty, unscientific examinations are usually occasioned by a lack of interest on the part of the analyst, ignorance of proper methods, or insufficient time for a thorough job. Because considerable importance may be attached to any published food habits figures, the science of wildlife management would be benefited more if cursory examinations of this kind had never been made. The old axiom "if a thing is worth doing, it is worth doing well" certainly holds true in this case.

Few technicians have the training and experience necessary to classify them as experts in the laboratory analysis of stomach contents, scats, and pellets. This requires an intimate knowledge of the flora and fauna of the region where the food samples were collected and of microscopic techniques in identification of hair and feathers. One must also be a taxonomist to be able to list properly the animal and vegetable items found, an anatomist to iden-

tify bones, feet, bills, teeth, etc., and a botanist, mammalogist, ornithologist, entomologist, and herpetologist to recognize plant, mammal, bird, insect, reptile, and amphibian remains. In other words, *good food habits technicians are made, not born!*

(2) *Misidentified scats or pellets.* If representative scats from a mink, an opossum, a skunk, a raccoon, a gray fox, a red fox, and a bobcat, each of which had eaten a meal of cottontail rabbit, were placed side-by-side, how many wildlife technicians could correctly name the source of each? Similarly, how many would be capable of distinguishing the pellets of the barn owl, short-eared owl, long-eared owl, barred owl, and great horned owl if these were all composed of nothing but the hair and bones of meadow mice? How many times have the fecal droppings of one or more other species been collected and analyzed as fox scats by undiscerning field workers? Might not this add to or detract from the economic value of a predatory animal?

This is not to infer that technicians regularly produce distorted figures because the source of their series of scats or pellets have been falsely identified, but the possibility of error is mentioned as a note of caution to inexperienced wildlife workers.

(3) *Insufficient data with samples.* It is common failing among cooperators who are furnishing stomachs or other food samples of predators for a study to forget to record the date, the locality where collected, method of taking the animal, bait used (if any), and even the species name. The fact that predator food habits figures are only valid for a specific time and place makes the recording of this information indispensable. If bait is used to trap or poison a predator, the nature of the bait should be listed so that this item can be excluded from the

stomach samples, unless it should occur more than once in a stomach.

Many fine series of predator food samples have had to be discarded, or their value has been greatly reduced, because of neglect or forgetfulness on the part of the collector.

### Seasonal Variations

One of the most serious criticisms of predator food habits studies arises from the fact that, in many instances, the investigator will collect and analyze a series of stomachs, scats, or pellets during one or two seasons of the year and publish the results as representing the typical diet of that animal. For many years, almost all of the food analyses for the fur-bearing animals were made for the fall and winter seasons when stomachs were available from animals trapped for their fur. Without a fair sampling from the spring and summer months, the figures told only part of the story, and the economic status of a predator could be greatly changed by the addition of the warm-weather diet. Because of these short-term studies, pressure groups could, with a little search, find and use published figures which most nearly suited their purposes. For instance, fox-hunting clubs have distributed literature to farmers, sportsmen, and other antagonistic groups showing that foxes eat only fruit, insects, and mice on the authority of Joe Jones, wildlife expert from some state at least 500 miles distant.

The broad-winged hawk can be used to illustrate the decided seasonal variation in diet. Broadwings shot in the early fall will almost invariably contain some Orthoptera and Lepidoptera, and most often their stomachs will be distended with these large grasshoppers, katydids, and caterpillars. A series of stomachs collected at this time of the year would certainly classify the broadwing as decidedly beneficial in its feeding habits. But in the spring

when most insects are comparatively small and many are unavailable, this hawk is forced to eat other types of food. Now small mammals, amphibians, and reptiles are represented regularly, and recent studies (Latham, 1946) indicates that the broadwing may be an important factor in the decimation of juvenile ruffed grouse when the hawk is under the stress of feeding its young. It is possible that the broadwinged hawk and other predatory animals may be almost entirely beneficial during eleven months of the year, but may, during the remaining month, exhibit feeding tendencies inimical to man's interests. Such short-term influences could be easily missed by the wildlife worker unless he collected a substantial year-round sample or was highly observant in the field.

The game manager's quarrel with the crow is confined to the spring and early summer months, except when it occasionally competes with game for winter food. Its condemned habits of destroying eggs, eating fledglings of song birds, killing and eating young game birds and cotton-tail rabbits, and even pulling corn all coincide with the reproductive activities of spring and early summer. If these unsavory habits were excluded, the feeding habits of the crow for the remainder of the year would be largely beneficial.

The stubborn tenacity of the Cooper's hawk, once it is able to locate a covey of bobwhite quail on deep snow, is often maintained until the covey is annihilated (Latham and Studholme, 1947). Under such circumstances, this hawk may kill one to two quail almost every day for a



PGC Photo by Latham

Material found at predator dens does not necessarily represent a true picture of the animal's diet.

period of a few days to several weeks. Stomachs collected at other seasons of the year, even from the same area, are unlikely to reveal losses of this magnitude.

In the West, the taking of big game animals by eagles is confined to the short period when the tiny young of such animals as antelope, mountain goats, and others are available. The destruction of ducklings by pike and snapping turtles can only occur at one season; muskrats may be most vulnerable to foxes and minks during a season of drought; and the food habits of many species may be greatly changed during plagues of mice and insects. In the far North, arctic foxes feed upon birds and lemmings in summer but subsist upon the remains of seals killed by polar bears and the dung of the bear during the winter.

From the above discussion, it can be seen that the food habits of most predators change with the seasons, particularly in temperate climates, and, unless each of the seasons is represented proportionally, an accurate year-round sample cannot be obtained. It is suggested that, where the seasons are not equally represented but, nevertheless, adequately sampled, the figures might be adjusted to give a truer picture of the economic status of a predator.

It is admitted that the result cannot be completely accurate, but those who criticize a mathematical adjustment cannot deny that the final table will be *more nearly accurate* than the original unadjusted table.

### Yearly Variations

Because of the ever-changing population levels of predatory and prey species, because of the effects of drought, snow, excessive rainfall, and other meteorological factors upon the availability of prey, because of natural or artificial alterations of the habitat and the amount of protective cover it may provide, and be-

cause of the introduction of exotic species, the diet of predatory animals may vary considerably from year to year.

Food habits studies continued over a period of years for the same species and for the same area will often show widely divergent figures. To illustrate, Luttringer and Sutton (1924-1934) who examined the contents of 538 goshawk stomachs from Pennsylvania found that 31 per cent of the stomachs contained ruffed grouse, 24 per cent contained cottontail rabbits, and 9 per cent gray squirrels. A few years later, McDowell and Langenbach (1937-1940) analyzed the food found in 101 goshawk stomachs from the same state, but found only 13 per cent contained grouse, 15 per cent cottontail rabbits, and 19 per cent gray squirrels. Were grouse and cottontails more abundant during the decade from 1924 to 1934 than they were during the late 30's, were these prey species more readily available because of deeper snows or some other environmental factor, or were other prey items relatively scarce and the hawks forced to concentrate upon these two species?

Many kinds of prey (grouse, varying hares, most mice, and others) exhibit marked population fluctuations. These cyclic species are almost certain to appear in fewer numbers in the diet of predators during the "low" of the cycle than at the "peak." Short-term studies made at the time of greatest abundance and again at the time of least abundance of a cyclic prey animal might produce food habits tables which would indicate a malevolent predator-prey relationship on the one hand and a comparatively benevolent relationship on the other. (But even though a particular prey animal may appear infrequently in the stomachs of predators during the low of the cycle, this does not mean that the pressure is not equally as great, or greater, than

when many individuals are taken during periods of abundance.)

The investigations of Errington (1937) and others have shown that muskrats and other prey animals may be exceedingly vulnerable to predation during periods of drought. Thus, during drought years, the fox, as one example, may become a potent factor in the decimation of muskrat populations but may exert only moderate pressure during more normal years. The literature is full of references to the vulnerability of prey upon deep snows, particularly if these are long-continued. This insecurity is occasioned by a sparsity of concealing cover and is heightened by a physical weakness of the prey resulting from food scarcities. Floods, forest and prairie fires, cultivation, lumbering, and other changes of the environment may create a temporary susceptibility of prey which could alter the food habits of predators.

Even the introduction of new prey species, or the large-scale planting of artificially propagated game, or the establishment of new or expanded poultry or livestock industry in a region may all affect the diet of predatory animals from one year to another.

Thus predator food habits studies made in the past cannot safely be applied to the present nor the future. The list of prey items may not contain many, or any, new species, but the comparative importance of the different items in the diet may be altered significantly. This is most likely to be true of predatory animals which select a varied and extensive diet, e.g., foxes, coyotes, *Buteo* hawks, and others.

#### Locality Variations

Three separate food habits studies of the red fox in Pennsylvania from three different regions of the state show clearly the variations which can

be expected from one locality to another. Of 147 red fox stomachs collected in the agricultural southeastern part of the state, 45 per cent contained poultry, 33 per cent contained cottontail rabbit, and 14 per cent contained muskrats. Only 1.5 per cent of the 147 stomachs analyzed from the mountainous north-central portion of the state contained poultry, 26 per cent cottontail rabbit, and none muskrats. Poultry was found in 16 per cent of the 131 red fox stomachs from the south-central region which is an intermixture of mountains and broad agricultural valleys. Cottontails were present in 50 per cent and muskrats in 1.5 per cent of the stomachs.

These are merely three of many items which illustrate the variances in diet between one locality and another. As would be expected, there were some prey species which occurred in the stomachs from one region but not from the others. From the southeast, 16 ringnecked pheasants were found but no ruffed grouse; from the north-central portion, the analyses revealed 6 grouse but no ringnecks; no ringnecks; and only one grouse was found for the south-central region, but bobwhite quail (2) appeared for the first time.

Even greater discrepancies appear when more distant geographical regions are involved. One would hardly expect the diet of a predatory animal found in South Carolina to be comparable to that of the same species in Maine, but oftentimes differences nearly as great exist between predator diets from forested areas and agricultural areas within the same state or county. Therefore, the same conclusion can be reached in regards to locality variations in diet as for seasonal variations in diet, i.e., that predator food habits are specific as to place and the findings for one locale should never be assumed to apply to any other.



*The diet of the barn owl is predominantly beneficial, consisting mostly of mice and other small rodents.*

## Interpretation

### Ecological Data Needed

AS HAS been stated before, no predator food habits table can be interpreted from an economic standpoint without additional knowledge concerning the relationships of the predator and its various prey to the environment and to man's interests. Economically, the occurrence of particular prey items in the diet of a predator means little unless it can be shown by ecological investigations that the predator-prey relationships are desirable or undesirable. The kinds of information needed for intelligent interpretation of predator food habits tables are discussed.

(1) *Availability of prey species.* Within certain limits, availability,

above all else, governs the diet of most predatory animals. Most carnivores are opportunists, and, if one prey item does not occur in fair abundance or is not easily captured, it will be replaced on the diet list by other, more readily available prey species, or even by non-prey items such as vegetable matter or carrion.

(a) *Abundance of prey—cyclic species.* It is only logical that when a prey species is abundant, its natural enemies are afforded more opportunities to capture and kill than when the species occurs only sparsely. Predator food habits studies conducted on a specific area and for a number of years are likely to reveal a marked fluctuation in the comparative quan-

tities of the various prey items consumed. This is especially true of cyclic species whose numbers may vary from a "low" phase to an "irruptive" or "plague" phase. The frequency of occurrence of a prey species in a predator's diet is often so closely proportional to the size of the prey population that a continuous examination of stomachs, pellets, or scats over a period of years can be used for determining the length and intensity of the cycle. Barn owl pellets often reveal the presence of species of mice and shrews which even at the peak of the cycle are never common. To attempt to establish the cycle for such rare species by the ordinary census methods (live-trapping or snap-trapping) would certainly involve a great amount of painstaking labor, but owl pellets are likely to give a reasonably accurate picture of the rise and fall of numbers with a minimum of effort.

Because a predator's food intake remains relatively constant in volume, except possibly in the Arctic or during winter, it means that an increased consumption of one item will almost certainly result in a proportional decrease in the quantity of other dietary items even though the population level of many of these may have remained almost static. The discrepancy constitutes the major source of error in the determination of cycles from food habits figures.

(b) *Weather conditions.* Meteorological influences which may affect the availability of prey animals have been mentioned as factors causing seasonal and yearly variations in food habits figures.

Deep snows may expose bobwhite quail and other upland game birds but provide a protective blanket for mice, shrews, and other small animals. During these periods of stress, the diet of a predator may vary considerably from the normal bare-ground diet and may change from beneficial to harmful for the duration

of the snow. The goshawk-ruffed grouse and Cooper's hawk-bobwhite quail relationships illustrate the increased vulnerability of certain prey on snow.

Errington (1937), Bennett (1938), Scott (1937), and Kalmbach (1937), and others have shown that drought intensifies predation upon muskrats, ducks, and other aquatic animals. When streams, ponds, and marshes become partially or wholly dry, these animals are denied the usual protection afforded by the water in diving or swimming, and it also permits predatory animals which normally shun water (foxes) to invade the very homes of these birds and mammals.

Drought may also cause an increased susceptibility of prey because of a sparsity of protective vegetation.

Floods may expose prey animals, especially to avian predators, and the sight of a marsh hawk gorging itself on meadow mice over "drowned" meadows is a common sight. Other, less important, weather influences may cause an increased or decreased take of prey items.

(c) *Physical condition of prey.* The natural vigor and ability to escape from predators may be lacking in prey animals which are suffering from malnutrition, exposure, disease, injury, and perhaps other physiological and pathological conditions. There is also the possibility of genetic weaknesses resulting from the mating of northern strains with southern strains which may produce offspring incapable of maintaining top physical quality during cold weather. Sometimes handicaps may be of a mechanical nature (mud-ballling, etc.).

Deep snows, ice storms, over-browsing or over-grazing, the failure of mast crops, extended drought, and other factors may cause a temporary shortage of food and a consequent malnourishment of prey species. Underfed animals are likely to lack the attributes of strength, speed, and

alertness so necessary to prevent capture by predators. The question arises as to whether the capture of prey weakened by a lack of proper food should, or should not, be charged against the predator. The answer appears to be simply that if the prey animals would have survived, had they not been killed, the predators should be held responsible. There are those, however, who will argue that the inadequacy of the habitat is the real cause and that predation is merely a subordinate factor. Probably this thesis is tenable where a prey population is living beyond the true carrying capacity of its food supply and is, therefore, already malnourished (many deer herds in the United States), but can hardly apply where the malnutrition and subsequent vulnerability cannot be attributed to a chronic shortage of food but instead is occasioned by temporary "crisis periods" during adverse weather.

During the occasional very severe storm when temperatures are well below zero and snow or sleet is accompanied by high winds, upland game birds and sometimes other animals may die from exposure even though in good flesh and with food in their stomachs. Those birds which survive are so weakened by the period of exposure that they may remain easy prey for several days or longer following the cessation of the storm. Immature bobwhites, ringnecked pheasants, wild turkeys, and other game birds may be temporarily enfeebled by cold rains and be easily caught by almost any predator.

The taking of diseased or injured animals by predators is called the "sanitation effect" by some writers. There appears little reason to doubt the value of this service, and it may be exceedingly important in the survival of some species. By eliminating the weak, the diseased, and the crippled before they can breed, physical degeneration is inhibited. This "survival of the fittest" may contribute to

the evolution of a hardier, wilder, more sporting game animal.

Latham and Studholme (1947) have advanced the hypothesis that the importation of bobwhite quail from southern states and Mexico into certain northern states has created a hybrid bobwhite which is unsuited to the rigorous climate of that region. Because during two different severe winters (1935-36 and 1943-44) more than 90 per cent of the resident bobwhite population was lost in Pennsylvania, and because during most winters the mortality from the combined forces of malnutrition, exposure, and predation is high, it is reasonable to assume that much of this susceptibility to predation may arise from genetic weaknesses especially when it is known that losses prior to the period of importation were comparatively negligible.

Yeatter (1934) describes "mudballing," or "clayballing" as it is known in Europe, as a cause of mortality among Hungarian partridge chicks. Ducks which swim into oil films on the water become helpless. These and similar mechanical handicaps add to the availability of prey animals.

(d) *Amount of protective cover provided by habitat.* With few exceptions, small game, or small birds or mammals of nearly any kind, will not thrive where there is a sparsity of vegetative cover even though food may be adequate. Quite often the numbers of the prey population are directly proportional to the amount of protective cover, with predation appearing to be the controlling factor.

The sparsity of cover upon land may be fairly constant as upon badly eroded areas; it may be seasonal as the reduction which follows fall frosts; it may be temporary as that which follows plowing or forest and prairie fires, or as caused by heavy snows. Whatever the cause of reduction, a sudden or gradual loss of

cover invariably means an increased vulnerability of small prey animals and a reduced carrying capacity of the land.

Errington (1934) observes: "Cover is of value to the bob-white chiefly as protection or concealment in case of attack by enemies. Lack of cover means vulnerability to predation, whether enemies are few or many. Cover also has a certain value as shelter during periods of wet or cold weather, or during storms, but the necessity of shelter for the bob-white is usually overrated about as much as escape cover is underrated."

(e) *Introduced species.* It is obvious that exotics cannot be represented in the diet of a predator before introduction. Therefore, food habits figures for a predator may change considerably after one or more new prey species have been introduced and have prospered. In recent years the ringnecked pheasant has become an important food item of the fox in certain areas and the Cooper's hawk-starling relationship is well known. The barn owl, which normally feeds almost entirely upon small mammals, will take English sparrows and starlings because of their easy availability when roosting in barns and other buildings accessible to both predator and prey.

Following the introduction of exotic game animals, there is often a regular stocking of pen-reared birds or mammals from game farms. Most often these artificially propagated animals lack the psychological qualities so necessary for survival in the wild. Because these traits for self-preservation are undeveloped, mortality from predation is especially severe during the first few days or weeks after liberation. Newly released birds are sometimes killed by hawks on their initial flight from the shipping crate. This destruction of game-farm stock will be discussed more fully in a later portion of the report.

(2) *Density of predator population.* "The relative numbers in which a species occurs greatly influence its ecologic and economic relationships. A rare species or one present only in few numbers in a given region may be of little biological importance, even if its activities are in general detrimental to the best interests of certain other species or to agriculture or forestry. But an over-abundant species, even if it might be beneficial when present in moderate numbers, may, by reason of its overabundance, be forced to use plants or animals for food which ordinarily it would ignore, and it may thus become a devastating pest. The abundance of a species may therefore determine whether or not it is detrimental and in need of control, or of negligible importance. Information secured from a survey of a region made in one year may not give a true picture of the ecology in a subsequent year, because the relative abundance of all the species concerned will very likely have changed in the intervening time." (Dice, 1938)

Leopold (1931) states that "broadly speaking, therefore, variations in the damage inflicted by predators upon game must arise largely from local variations in the density of predator populations and from differences in food habits of the various species."

In his discussion of fox-quail ratios in different counties of Missouri, he continues: "It is easy to see how one fox per 75 quail might result in serious depredations, whereas one fox per 1,500 quail could hardly be felt, no matter how strong the disposition to catch quail.

"It is such evidence as this that forms the basis for my opinion that the fox question is not so much one of whether foxes do more harm than good, but rather a question of what density of fox population affords the best balance between harm and good."

Predator-prey ratios are sometimes surprisingly unbalanced. During the recent irruption of foxes in Pennsylvania, which reached a peak in 1946 when 47,664 red and gray foxes were submitted for bounty, the ratios between foxes killed and game killed by hunters demonstrated the superabundance of these predators. During that year, six foxes were killed for each quail shot; 20 foxes for each wild turkey; a little more than one fox for each grouse (1945, closed in 1946); one fox for each four ring-necked pheasants; and one fox for each thirty cottontail rabbits. When one considers that only a few thousand hunters and trappers actively chase or trap for foxes as compared to the army of well over 800,000 hunters who pursue small game in Pennsylvania, the possible destructive capabilities of the predator population becomes even more obvious. For the entire habitable land area of the state, it was estimated that there was one fox for each 125 acres in 1946, and in some regions the known density reached a high of one fox for each 12 acres.

The densities of emigratory species may fluctuate with startling abruptness. During the biennium 1935-1937, 1,781 goshawks were bountied in Pennsylvania, but, during a seventeen-year period (six years preceding 1935 and eleven years following 1937), only an average of 65 of these hawks were presented each year. The total effect of these hawks upon game populations during years of peak emigration following the "crash" of the snowshoe hare populations in Canada is tremendous compared to more normal years when as few as 15 have been bountied for the entire state.

The density of all other predator populations may fluctuate from year to year or from season to season. What is the significance of predator density to the proper interpretation of food habits tables? No matter

how destructive a predator may appear from an examination of its diet, its total effect upon desirable prey populations is likely to be proportional to the density of the predator population unless the prey species itself is exceedingly rare and in danger of extermination, or unless the individual prey animal has a high personal-property value, i.e., livestock and poultry. In other words, could the 15 goshawks presented for bounty during the fiscal year 1942-43 in Pennsylvania materially affect the total numbers of ruffed grouse in the state even though each one is reputed to kill as many as 50 grouse in a single winter (Criddle, 1930)? Would 750 grouse, more or less, be noticeable in a population numbering into several hundreds of thousands? On the other hand, the 1,080 bountied during 1936-37 could kill, at the above rate, 54,000 grouse during the winter, and this number might have some significance in management. If the goshawks increased to 10,000 or 20,000, the resulting depredations might seriously reduce the numbers of grouse and cause acute shortages in certain areas.

(3) *Past and present predator-prey relationships.* Another variable modifying the interpretation of predator food habits tables concerns the past degree of control, or reduction, effected by a predatory species as related to its present association with the prey animal. It is conceivable that a predator population, because of an increase of numbers or because of fortuitous environmental changes, may be able to reduce markedly the numbers of a certain prey species over a period of a few months or years, and thus control this species at a low population level for an additional period of months or years. If food habits studies of the predator were made during the initial phase of the reduction period, the prey animal is likely to appear to be an important item of the diet and much

significance could be attached to the predator-prey relationship during this time. Later, after the prey population has been decimated and is being controlled at a much lower level, food sample analyses would reveal comparatively few of these animals in the diet. The tendency then, with no ecological information for guidance, would be for the interpreter to assume that the relationship was far more benign. However, the total impact of the predation is as great in the second case as in the first, even though the percentage of occurrence may vary considerably at the different times.

As would be expected, an almost complete reversal of the relationships defined in the above example would be possible under different conditions. A prey species may constitute the principal item of a predator's diet and yet be increasing at a rapid rate. This is often true of rodent populations.

(4) *Abundance or scarcity of buffers.* Many of the so-called "buffer" species, most of which are rodents, are cyclic in nature. These small animals which often partially divert the depredations of predators from game species, are likely to fluctuate, often extraordinarily, in numbers from one year to another. When a buffer species is at its peak of abundance, the diet of some predators may be largely composed of these animals, and, as a consequence, game and livestock may be relatively secure. On the other hand, when buffers become scarce greater pressure is thrown upon other species and the economic classification of a predator may change considerably. It is necessary, then, to ascertain the presence and relative abundance of buffer species before predator food habits tables can be interpreted with a reasonable degree of accuracy.

The value of buffers in the ecology of desirable wildlife will be discussed in Part II of this report.

## Economic Classification of Predators

IT HAS been stressed again and again in this report that the economic status of most predators cannot be determined with any degree of accuracy from the interpretation of food habits tables without additional ecological information as a guide. There appear to be exceptions to this rule where the predator's diet seems to be almost wholly beneficial or wholly harmful. For instance, barn owl food habits studies almost invariably reveal a preponderance of small rodents, particularly mice, and few persons could deny the good accomplished by this raptor. However, it could be possible on non-agricultural areas that an abundance of barn owls would so seriously cut into the supply of mice that certain valuable furbearers could not thrive, and an important economic loss could be

incurred by residents of the region. Goshawks, which are recognized to be exceedingly destructive to game, poultry, and other beneficial species may, on more primitive areas, be a significant factor in the survival of certain prey species. Particularly in cyclic animals, the removal of diseased individuals may greatly alleviate the devastating effects of the "crash" and prevent a species from sinking below a recovery level. All predator food habits tables, no matter how seemingly cut and dried, should have the careful scrutiny of a trained ecologist and an investigation of the ecological relationships upon the area involved before final judgment is pronounced one way or another upon a predator.

It is taken for granted that no "rule of thumb" method can be used

to classify a predator, but Dixon (1925) has suggested a guide to the evaluation of furbearers. He enumerates the credit and debit qualities of these carnivores as follows:

#### *Credit*

1. Value of pelts produced
2. Harmful rodents destroyed
3. Injurious insects eaten
4. Recreational value

#### *Debit*

1. Destruction of game
2. Destruction of domestic animals
3. Transmission of disease

Bennett and Nagel (1937) propose a series of excellent questions which should be asked in the economic classification of any predator:

- "(a) Does the *individual* predator destroy *only* members of the prey species considered?
- (b) Do *all* members of the predator species destroy *only* members of the prey species considered?
- (c) Do they kill active, healthy individuals, or do they cull out the weak, the diseased, and the crippled?
- (d) Would the predator kill the particular prey if there were anything else available as a 'buffer'?
- (e) Would the predator kill this particular prey if the latter had adequate cover?
- (f) Does the predator compensate by killing other species injurious to man's interests or to the interests of the 'desirable' species?
- (g) What would be the results of complete extermination of the predator?"

They also suggest that "from the human standpoint, no species is either wholly 'good' or wholly 'bad.' "

And McAtee (1931) warns that: "What needs to be kept in mind at all times is that in assigning economic values to natural enemies, it is best to speak in terms of tendencies rather than of achievements. Good economic

tendencies are as satisfactory as any grounds for advocating the protection of natural enemies."

The intricacy of the problem is illustrated by Snyder (1947): "If we assume that man's interests are paramount—that we have the prerogative to condemn or acquit other creatures that live according to natural law, and that there are no extenuations even though the predator is virtually 'baited' to the farm yard by unprotected poultry—there is still great difficulty in establishing a full and fair economic evaluation on a hawk or an owl. For example, it is an established fact, and well known, that meadow mice girdle and destroy young orchard trees and that deer mice consume and foul cereal grains. This booklet, and many other similar studies, establishes the fact that several species of owls and certain hawks destroy these mice regularly and in quantity. If we search no further for facts we can regard these birds of prey as strictly beneficial. But if our economic accounting is more complete and thorough we will find that the food animals—mice—are assets in some respects. Mice are important staple foods of valuable fur-bearing animals, and they destroy weed seeds and noxious insects. Of course, we must decide what is a weed and what is a noxious insect! Thus, the book-keeping of economic evaluation becomes more and more complex. For the most part, a study of the food habits of a certain bird can produce quantitative information, but precise and complete economic evaluation is impossible. If we must judge rather than measure, then the writer suggests that we can more adequately judge as to the desirability or undesirability of an individual bird at a given time and place than we can for a species throughout the year or over its whole range.

"It should not be overlooked that there are real values in wildlife which

are not economic and which cannot be measured quantitatively. Most people would admit that the familiar robin has a value but if evaluation is based on its food habits alone, it cannot be graded high. Robins raid the cherry orchards; they consume earthworms in quantity—these creatures are important in mixing and fertilizing the soil and in making it pervious to air and water. Do we not value the robin most for its song, for its moderate and flattering familiarity, for its very being? How can these things be given economic and quantitative values? How many songs equal a quart of cherries? What is the dollars-and-cents value of the sight of a soaring eagle, or the wise look of an owl?"

The interests of the people as a whole, and not the selfish desires of individuals or groups, should be paramount in evaluating a predator. "In determining the economic status of any species in a given region, it is necessary to know not only its ecologic relations to its habitat, to its food, and to its animal associates, but also it is necessary to know the relations of the species to the welfare of various groups of people in the community. In a farming community the interests of the farmers must receive careful consideration, but the interests of trappers, hunters, nature lovers, teachers, and scientists must not be neglected." (Dice, 1938)

Finally, the whole complex matter of economic classification of predators is summarized by Kalmbach (1934): "From the foregoing one comes to the conclusion that the solution of our more important problems in economic ornithology depends largely on exact and pertinent field observations, without which much of our stomach examination data would have little significance. More than ever in these days of local adjustments in problems of wildlife there is need for a correct interpretation of facts. To be able to identify

items with specific exactness, items of utmost importance in the economic relations of the bird, and yet be unable to state whether those items should be placed in credit, debit, or neutral categories with respect to the economy of man plainly indicates that other methods of approach must at times be involved. By all means there must be no slackening in laboratory research, but wherever it is evident that this method is incapable of accomplishing the object sought, there should be no hesitancy in adopting also some other plan that will give corroborative or other evidence of the status of the species."

He continues: "Workers in economic ornithology freely admit that food percentages, however computed, still must be interpreted by the investigator before decision on the status of a species may be determined. Abstract decimal or fractional values cannot be subjected to mathematical formulae and results computed therefrom as can be done in problems of engineering or chemistry. One estimated percentage indicating a beneficial activity cannot be construed as offsetting an equivalent designation of opposite economic significance. After all the painstaking examination and computation of food percentages of a species have been completed, what we have is simply a somewhat more tangible and understandable picture of food preferences. The conversion of this into terms of human economics is a matter resting largely on the personal judgment of the investigator. The wider his field experience and the sounder his logic, the more accurate will be his appraisal. A sympathetic understanding of agricultural problems will add much to the value of his decision. Yet, at best, in the attempt to convert abstract food percentages into terms of human economics, the ornithologist still is confronted with a problem of no mean proportion or complexity."



WILDCAT

**PART II**

# *Predator Management*

## **INTRODUCTION**

THE predator problem must surely be as old as man himself. Perhaps, if there had been an abundance of red-shouldered hawks or road-runners in the Garden of Eden, the serpent which caused the downfall of Adam and the subsequent tribulations of all his descendants might have perished before it could have accomplished its temptations.

Probably the first lowly forms of humanity exhibited some emotion akin to resentment as they peered from their caves at some large carnivore carrying off a highly prized food animal. And even worse than this unpleasant competition, *man during the earlier stages of evolution was an important prey animal himself*. Primitive man faced a real predator problem!

For countless centuries, predators had been ruthlessly destroyed at every opportunity and no single benefit was ever ascribed to their activities until ecologists and wildlife biologists of the past sixty to eighty

years endeavored to separate the good from the bad and attempted to determine the true role of each living thing in the scheme of nature. However, this pioneer work has done little more than scratch the surface toward establishing the place of the predator in the economy of things. For this reason, controversy is at its height. A man may be right today and wrong tomorrow. A hypothesis accepted this year may be rejected the next.

The infancy of the subject and the serious need for much additional research can best be illustrated by the declaration that *almost any statement concerning predator-prey relationships or the over-all economics of any predator's activities can be wholly or partially refuted by scientific study, by direct observation, or by expert opinion*. Is it any wonder that predation and predator control are the most controversial subjects in wildlife management today?

## **THE UNIVERSAL LACK OF AGREEMENT ON THE PREDATOR QUESTION**

Among the several groups which, because of selfish interests, prejudices, or other reasons, have taken firm stands concerning predation and predator control, there can be listed the sportsmen who resent the competition of predators for game or fish; the farmers and stockmen whose cattle, sheep, or poultry losses are a direct economic liability; the nature lovers who believe in the preservation and protection of nearly all animal

species, predatory or otherwise; the game manager whose job is to provide the greatest possible number of a few chosen species for recreation, even if it is necessary to sacrifice the lives of predators to accomplish this end; the ecologist who alone looks at all possible effects of predation, beneficial and harmful, and attempts to establish the economic status of each species from this broad, unbiased viewpoint; and, finally, the indiffer-

ent group who, because they never hunt, fish, raise livestock, nor commune with nature, care little, one way or another, whether predators are killed or are not killed. Peculiarly enough, the indifferent group is probably larger than any of the others.

"No topic in the wildlife field is more controversial than that of predator relationships, and on none perhaps is there more loose thought and positive opinion based upon insufficient consideration of the evidence that is available.

"Individuals interested in certain forms of wildlife also may become partisan and prejudiced in their judgment and deprecate the faults and glorify the virtues of favored forms. The extreme views among sportsmen, conservationists, and even biologists, on the subject of predator relationships, without a full weighing of the evidence, add to the vast problem of the interrelationships of all living forms. This relationship cannot be comprehended either by citing isolated individual experiences or by purely theoretical biological thinking." (Gabrielson, 1941)

Dr. Gabrielson's final statement—*"This relationship cannot be comprehended either by citing isolated individual experiences or by purely theoretical biological thinking"*—is a warning which should be heeded by all persons who have taken a determined stand on the question, no matter what this stand may be.

Kalmbach and Linduska (1948) state: "We probably will never see the day when there will be an unanimity of opinion with respect to the degree of control (we could more intelligently use the term management) that is most desirable for certain forms of wildlife. It will vary with every local situation, it will change with every season, and it will appear different from the viewpoint of every person in the same community depending on their divergent interests. The overall problem has much in common

with that of managing forest lands and other public domain to obtain the greatest good for the greatest number and not, necessarily, for the total satisfaction of any one interest, however significant it may appear to be."

McAtee (1932): "The outstanding feature of correspondence that comes across the desk of the economic ornithologist is the whole-souled sincerity of the writers. To each of these, apparently, the individual point of view is so engrossing as practically to exclude all others, and so undeniably right as automatically to overwhelm any possible conflicting idea.

"Naturally, each correspondent expects sympathetic response, if not full surrender, to his argument, and that is one of the things that makes 'the first hundred years the hardest' for the economic biologist."

The ways in which conflicting groups may regard each other's thinking is described by Tavener (1939): "One group argues vehemently that every creature saved from the claws and jaws of natural raptors is one more that can be devoted to man's use or to the prosperity of the favored species. The other postulates that the predator is a normal and necessary factor in the economy of nature and its elimination would be disastrous to the end in view. The school that regards itself as being 'common sense' and 'practical' views its opponent as doctrinaire, theoretical and sentimental; the other school prides itself on its scientific caution, its wider field of vision and more exact knowledge of biological reaction."

Individuals and groups when confronted with facts, or when imbued with a greater knowledge of animal interrelationships, may alter their convictions concerning predation. Cahalane (1939) has said: "Whether based on research or current belief, predator management has been greatly influenced by superficial ob-

servation, personal bias, exigencies of the occasion, and group pressures. Control methods have varied, tending of late decades toward those of greater selectivity. Even the species included in official lists of predators have varied. Numerous at first, these became fewer with the passing years particularly by exclusion of the smaller carnivores."

Gabrielson (1941) reflects the possibility of changing opinion even among wildlife biologists when he says: "After fifteen years spent in intensive work in predator- and rodent-control problems and on studies of the interrelationships of predatory and other forms, the writer confesses that he is much less certain as to the significance of these relationships than he was before his biological

theories had been tested by stubborn facts encountered in field experience."

It is significant that many of the men who have had the greatest amount of field experience—those who have studied the relationships between predators and their prey on the land—favor the control of predatory animals. Those who are vehemently opposed to predator control are often persons with little actual field experience in respect to this problem. In fact, many of the "protectionists" have never lived outside of a large city, and it is interesting to contemplate whether their attitude toward predators might change if they were to become farmers, ranchers, or even hunters for a few years.



PGC Photo by Latham

Predators, like the mink above, provide a valuable source of income to the trapper and hunter.

"A fully informed public will give scant attention to the opinions of Slingshot and Spittoon Clubs that loudly favor wholesale extermination of all 'vermin,' or the maudlin sentimentalities of Pee-wit Twitter Societies that flutter to the support of a 'hands off' policy toward all wildlife. A fully informed public will recognize the worth of predator and rodent control policies based primarily upon the economic necessities of resource conservation, except for predominance of esthetic considerations on specialized recreational, wilderness, and sanctuary areas. . . ." (Presnall, 1949)

Darrow (1947) and Grange (1949) both point out that one of the principal stumbling blocks in the way of agreement upon the predator question is the failure to differentiate between the fate of populations and that of individuals. Grange suggests that Nature is careless or indifferent to the fate of *individuals* but in the end careful and concerned with the fate of *populations* or *species*. Most of those who favor predator control are thinking in terms of individual animals lost, while most of those who oppose control are usually thinking only in terms of species or population survival.

## WHAT IS A PREDATOR?

Webster's New International dictionary defines predator as "one who or that which is predatory." Predatory, in turn is defined: "(a) Living by preying upon other animals; predaceous. (b) Destructive; damaging (crops, buildings, etc.) by consumption; as *predatory* insects or birds."

Riter (1941) suggests a more restricted definition: ". . . a predator may be defined as any wild animal that preys upon one or more species of other wild animals that are being fostered in wildlife management plans."

Pearson (1933) perhaps gives the most poignant definition of all: "Vermin is any wild creature that kills something you want to kill."

Of course, either of these two definitions must be somewhat altered to be truly applicable. Riter by using the modifying adjective "wild" has excluded the domestic dog and cat in his definition, but these two animals are considered important predators in wildlife management. Pearson excludes prey animals which provide us with pleasures or benefits other than those derived from hunting or fishing. Some may, and do, resent the

killing of a cardinal, as much as the killing of a game bird, by a Cooper's hawk, if the sight of this brightly colored bird has pleased them.

Perhaps a composite of the three would provide the best definition. A predator, then, would be any animal which preys upon one or more species of other animals. Economically important predators are those animals which prey upon one or more species of other animals which are, because of their activities, either beneficial or harmful to man's interest or which have esthetic value.

According to the above definitions, nearly any animal may, at times, be predatory. The titles of short notes from the *Auk* indicate the extent of predation. Here are a few picked at random: Purple Gallinule Robs Nest of Green Heron; Great Blue Heron Swallows Large Snake; Predation on Living Prey by the Black Vulture; Red-bellied Snake in Ruffed Grouse Crop; Black Vultures Kill Young Pigs in Kentucky; Golden Eagle Captures Red-shouldered Hawk; Leopard Frogs Devouring Small Birds; White-winged Junco Killed by Clark's Nut-cracker; Hummingbird Killed by

Praying Mantis; Purple Grackle Kills English Sparrow; Coot Attacks Young Duck; and Red-breasted Merganser Devoured by Angler Fish.

The word "predator" to many means only animals of a harmful or destructive nature. But to the contrary, some of our most beneficial species are true predators. In the study of predators, one fact stands out above all others and that is *that the most destructive predators may under certain conditions be decidedly beneficial and those recognized as beneficial may at times or in certain places be definitely destructive*. And

further, there may be predator-prey relationships as yet undiscovered which may be more deleterious to man's interests than many which are causing him grave concern at the present.

So, whether we call them predators, carnivores, natural enemies, vermin, or some other appellation, it should be remembered that these terms do not necessarily denote harmful activities, but that in many instances these specialized animals are among the most beneficial and most desirable of all forms in terms of human economy.

## THE ECOLOGY OF PREDATION

### **The Role of the Predator in the Scheme of Nature**

A fitting introduction to this portion of the report is given by Snyder (1947). He says in part: "To understand the place which birds of prey [or all predators] occupy in nature one must appreciate certain of the interdependences of different forms of life. Everyone is familiar with the fact that certain animals prey on smaller and weaker ones, but it is perhaps not so generally realized that this same principle is of universal application. The wolf eats the deer that browses on forest herbage; the lion devours the antelope that feeds on the grass of the African veldt; the fisher kills the porcupine that gnaws the bark of trees; the lynx lives on hares that feed, like the corresponding animals in the examples just cited, on vegetable matter. These are examples of food chains which are of universal occurrence in nature. But food chains frequently have more links than are shown by the examples given. For instance, the trout devours the minnows which eat aquatic insects; these feed upon still smaller creatures which in turn eat microscopic plants in the water. Although this food chain is longer than the

others, it resembles them in two respects—the ultimate food material is plant matter, and the animal at the upper end of the chain is a carnivore.

"It will be readily appreciated that the numbers of individual animals in what may be termed the 'prey group,' must ordinarily be greatly in excess of the numbers in the group feeding upon them. Where there are a series of groups depending one upon the other for subsistence there is a tremendous expansion of numbers from the larger to the lesser—from top to bottom. . . . From the bottom to the top of the pyramid the creatures increase in size but decrease in numbers. The rate of increase of the different species which is determined by their reproductive capacities as modified by the percentage of survival among the young is ordinarily so balanced in nature as to maintain this pyramid of numbers.

"It has been pointed out above that the birds of prey, in common with other carnivores, occupy a very definite and pre-eminent position in the scheme of nature and we are led to speculate as to the role which the carnivore plays in such a scheme. To

understand this role we must remind ourselves of certain facts with reference to the numbers of living creatures. It is well known that most birds, mammals, insects, and other forms of life tend to increase very rapidly in numbers. For examples, mice have several young at a litter and usually several litters a year. Birds do not reproduce so rapidly, but if all the young which are hatched reached maturity and reproduced in their turn, the earth would soon be congested with birds. What actually happens under normal conditions is that the numerical abundance of birds, insects and other creatures remains moderately uniform. From a single pair of parents of a species maintaining a level of numbers, only two offspring, *on the average*, reach maturity and reproduce in their turn; all of the others perish. The principal factors which tend to level off populations are storms and severe weather, carnivores, parasites, disease and accidents. If it were not for the persistent action of these destructive forces each species would go on increasing until ultimately it had eaten all available food, resulting in death by starvation. Various species of insects from time to time break away from the control of natural enemies and multiply at an alarming rate. They sometimes denude trees of their leaves and devastate field crops over wide areas but ultimately a depletion of food results in their starvation, or so reduces their vitality that they perish from disease or disorders closely akin to disease. Another example of the attainment of extraordinary numbers is afforded by the varying hares of the north woods. Periodically the hares become very numerous and then some malady spreads among them and reduces their numbers almost to the vanishing point.

"Throughout the ages, by a kind of trial and error process, nature has evolved a safe and steady counter-

force which works against the suicidal expansion that is potential in all species. An important factor in this counterforce is the carnivore. Birds of prey, for example, are a much safer means of controlling numbers than starvation or disease because there is always the danger that these scourges may wipe out a species entirely. Carnivores do not exterminate the species on which they prey. If their prey becomes very scarce they too cease to flourish since they cannot exist in numbers disproportionate to their food. Man is the only predator at all likely to exterminate a species."

### Generalizations Concerning Predator-Prey Relationships

Gabrielson (1941) has outlined several basic principles of predator relationships:

"(1) Under normally stabilized conditions over a wide range, predators generally live upon surplus populations of prey species and their activities in the aggregate have little or no effect upon the breeding stock needed for the succeeding season. Local readjustments in accordance with varying conditions are often desirable to maintain a balance, though this can never be perfect; the observed *average* stability of animal populations emphasizes this point.

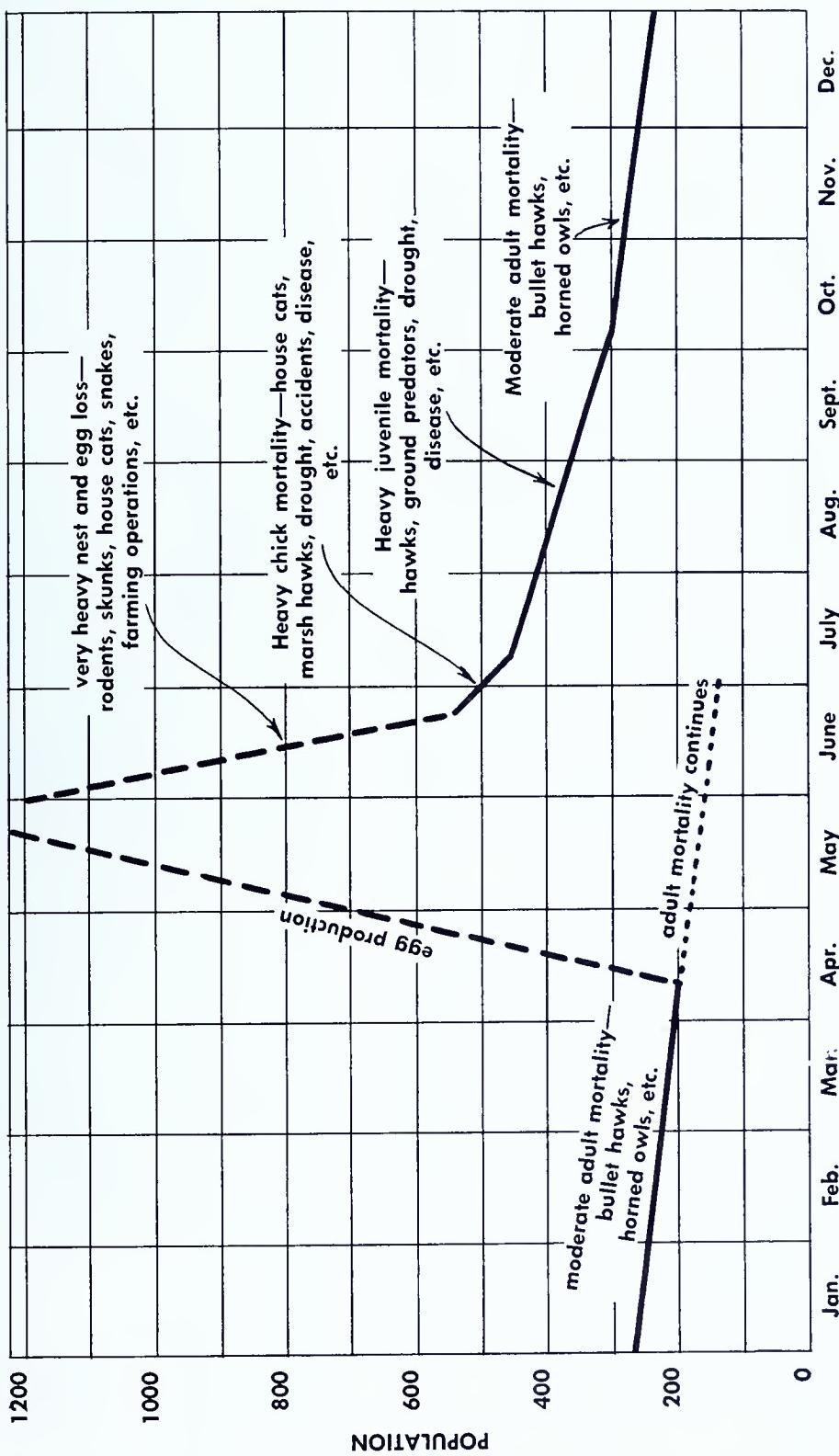
"(2) Under special conditions, either favorable to the predator or unfavorable to the prey, predators may become a real factor in decreasing populations or in preventing recovery following a decline in population.

"(3) The effect of predation upon population is more evident when the predator is a more prolific species than the prey. Where the reverse is true, the effect is at least obscured by the fact that the victim has a greater reproductive capacity than the predator.

"(4) Generally the agency of predators in reducing large populations

FIGURE 1

Diagram of the annual rise and fall in a population of valley quail and some factors that influence the seasonal changes in numbers.  
The population figures are approximate for a section of land, 640 acres. (From Emlen and Gladding, 1945.)



is minor compared with the more vital one of available food, the supply of suitable cover, the correct interspersion of these two essentials, and disease. Any one of these, or factors unknown, may be more effective than predation in limiting numbers.

"(5) Human interests, primarily economic, will always be paramount, and when predation on domestic animals is involved it is useless to explain it from the purely biological point of view. If domestic-animal populations alone were concerned, predation on herds or flocks might not result in a serious or abnormal decrease, but the economic factors involved and the sociological effects preclude a purely biological approach to the problem.

"(6) The numerical ratio of game animals and game birds to their natural predators may be disturbed when human hunters in large numbers enter the field. Utilization of the game crop by man, therefore, may necessitate some reduction in numbers of predatory species, if a supply of game is to be maintained."

Allee et al. (1949) list generalizations concerning the intensity or degree of predation at different levels of predator and prey populations: ". . . (1) when the prey and the predator populations are both large, predation would be rather consistently intense; (2) when the prey population is large and the predator population small, the intensity of predation per individual predator would be high, but the total predation light; (3) when the prey population is small and the predator population large, the total predation would be intermediate; and (4) when the prey population and the predator population are both small, the total predation would be light."

Further general observations are offered by Trippensee (1948): "The effects of predation on a prey species as indicated by a variety of studies might be stated as follows; Predation

is only one of the forces of nature that reduces prey populations. Loss by predators of a well-fed population in a suitable environment will be negligible. Predation will be heaviest on the fringes of the population that occupy the poorest part of the range. If predator numbers are not excessive, the wildlife manager will do well to look for weaknesses of the habitat rather than expending undue efforts in eliminating predators."

Leopold (1933) in discussing predator-prey relationships listed five types of predation. These have been summarized by Bennett and Nagel (1937) as follows:

"(1) *Chance predation.* The result of accidental meeting between predator and prey. It does not select the 'fit' from the 'unfit' and therefore does not benefit the prey species. The damage done, however, is usually small and does not tend to increase.

"(2) *Habit predation.* The accidental finding of a quail nest by a raccoon or a skunk is apt to develop the ability of an *individual* predator to find more nests, until this type of predation becomes a habit.

"(3) '*Sucker list*' predation. The capture by a predator of a few unwary individuals, before the prey species learns of the presence and habits of the predator and develops means of evading it. The benefit to the prey lies in the 'education' that the survivors receive in protecting themselves against future onslaughts by the same predator. In quail, this takes the form of better use of escape cover, quicker flight, and the like. The damage due to this type of predation is limited, though it may occasionally be serious if food and cover are deficient, especially if food is scarce in the escape coverts.

"(4) *Starvation predation.* Where food and cover are deficient, the prey individuals are forced to an unaccustomed degree into the open to avoid starvation during bad weather. Starvation predation is to some degree

selective, in that the hardier individuals are likely to be the ones which survive longest. . . . Consequently, this type of predation is beneficial unless it annihilates a large part of the prey population, because it weeds out some of the weaker individuals.

"(5) *Sanitary predation.* In this type also, the predators cull out the 'unfit'—i.e., the crippled, diseased, slow, or stupid individuals. The damage is small, and the benefit to the prey species is obvious. It is just what the breeder of domestic stock does when he culls out his flock or herd, retaining the superior individuals for breeding purposes."

A mathematical study of predator-prey relationships was introduced by Kelker (1939) and was proposed to illustrate the fact that one predatory species may control one prey species, even though the prey species is a faster breeder, and other conditions are equal.

His problem reads: "Given an early spring population of 10 badgers per square mile and 15 ground squirrels (*Citellus*) per acre; the badgers have one litter of 4 young per season, the *Citellus* have 2 litters of 4 young per litter; one badger kills 2 *Citelluses* per day for 120 days before the latter hibernates; and furthermore, assume that of the 240 squirrels killed, one-half are the spring breeding stock (hence are killed before they reproduce). What are their relative numbers at the end of 5 years? Assume no other losses for either animal. Sex ratio is always equal or 0.5.

#### *Final Fall Population of Predator and Its Prey*

Year	First	Second
Badger .....	30	90
<i>Citellus</i> .....	26,400	67,200
Year	Third	Fourth
Badger ..	270	510
<i>Citellus</i> ..	141,600	124,800
		None

"Under the actual field conditions, no predator will exterminate a

given species of prey because the toll on it decreases as it is harder to find, until at a given low point practically all of the predator-pressure is turned to other foods, whereupon the prey starts to increase. When its numbers are again sufficiently numerous to bring a minimum amount of success to the predator, it will again harass the prey, eventually bringing about a decline in the prey. So the abundance of the prey fluctuates, for the greater the supply, the greater the demand upon it. The above equation is weak in that it carries the predation to the point of exterminating the prey. The annihilation of a prey species by the predatory species does not happen in an environment that offers any escape facilities for the prey."

#### Inter-Predator Relationships

Leopold (1933) mentions that the steady increase in numbers of weasels bountied in Pennsylvania between 1915 and 1930 might be coincident with the reduction of hawks and owls over the same period. It is known that the horned owl for one is a potent predator of the weasel.

Later bounty figures for Pennsylvania suggest still another inter-predator relationship. During the eight-year period from 1932 to 1940, an average of 65,000 weasels were presented for bounty annually (a high of 89,000). During this same period, the kill of foxes, both red and gray, averaged somewhere near 15,000 each year. Beginning about 1940, the fox population irrupted and the numbers taken increased rapidly until by 1946-47, 47,000 were bountied in one season. During this eight-year period, while foxes were reaching a peak, the average annual take of weasels fell to 15,000 with a low of 5,000 during 1944-45. Significantly, after the partial control achieved by eliminating 47,000 foxes in 1946-47, over 21,000 weasels were presented

for bounty. Whether weasels continue to increase in numbers as the fox population decreases remains to be seen.

Besides weasels, foxes are known to kill skunks, opossums, red squirrels, Norway rats, crows and other mammalian and avian predators with some frequency. Horned owls commonly kill skunks, opossums, weasels, smaller owls, crows, hawks, Norway rats, housecats, minks, and others. In fact, hungry horned owls

caged together will readily exhibit cannibalistic tendencies. Crows will eat the eggs of both hawks and owls, and red-tailed hawks are one of the foremost enemies of red squirrels.

With the extension of its range into Alaska, the coyote has become a serious menace to the fur industry there. Goldman (1930) has this to say: "It is even possible to trace the advance of coyotes by a marked decrease in the fox population, and

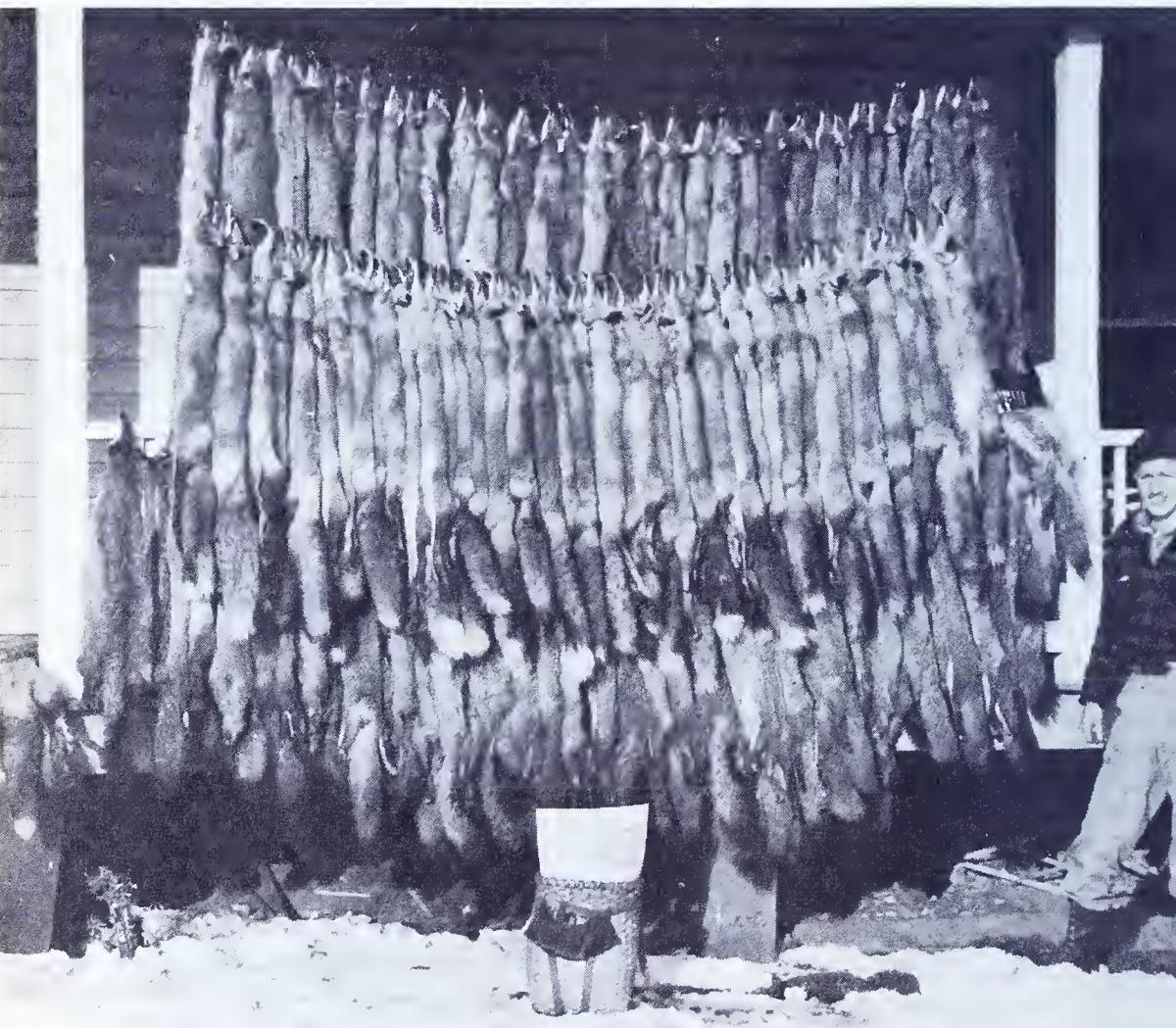


Photo Penna. Game Comm.

*Pennsylvania's four dollar bounty on foxes provides an added income for rural trappers.*

the trappers note it with dismay, for they are thus deprived of a valuable source of revenue . . . In many cases a family or entire colony of foxes are run out of their dens or are both run out and killed by coyotes which then use the den themselves. Wolves are well known to have committed similar depredations, but their killing is not so extensive as is that of the coyote . . ."

Probably the reader can think of other cases of predator killing predator, for there are many more, but just a few have been mentioned to emphasize the fact that this relationship does exist.

Its importance in the ecological complex of living things has yet to be determined, but, where this inter-predator strife tends to reduce materially one species while another prospers, the resultant modification in animal interrelationships may be of considerable significance.

### Inter-Prey Relationships Between Desirable Wildlife Forms

Under certain conditions, desirable prey animals which the wildlife manager wishes to protect against predators, may exhibit predatory tendencies themselves. For instance, Stoddard and Konmerek (1941) found: "Curiously, destruction of quail eggs and very young birds by heavy populations of wild turkeys may make it difficult to maintain high turkey and quail populations on the same ground, and owners may be forced either to discontinue quail shooting on lands where wild turkeys are becoming abundant or maintain a better 'balance' by bagging more of the turkeys."

Not too much is known concerning the inter-species relationships of prey animals—and especially of game animals. Leopold (1931) reports an instance of a cock pheasant killing an adult quail, but whether this occurs with sufficient frequency to warrant concern is a question still un-

answered. There is a common belief, but without much supporting evidence, that pheasants kill and eat many immature cottontail rabbits before they leave the nest. Errington (1945) suggests that pheasants may deprive bobwhite quail of good winter cover, because of interspecific intolerance, and perhaps push the quail out into less choice sites where they become more vulnerable to predation.

At times, more indirect relationships, such as competition for food, the destruction of herbaceous cover, or the dissemination of diseases, may be far more important as limiting factors than the more direct interspecific strife just illustrated. The ill effects of over-browsing by deer upon populations of cottontail rabbits, ruffed grouse, varying hares, and other forest-dwelling small game species is well known. The spread of diseases to wild game birds by wide-ranging poultry flocks is also recognized.

Perhaps future studies will disclose even more important inter-prey relationships.

### The Relation of "Buffer" Species To Game Predation

Like most subjects relating to predators or predation, there is not complete agreement upon the value of buffers in preventing predation upon game animals. At first glance, it would appear that large numbers of small rodents (mice, rats, ground squirrels, etc.) would satisfy the hunger of predators, and the game, where these small mammals were abundant, would be comparatively secure. However, Stoddard (1931) thinks differently: "The theory has frequently been advanced that such rodents act as 'buffers' between the upland game birds and their predatory enemies, and that if they were destroyed, the enemies of game birds would turn more to the quail or their eggs and do vastly more damage in conse-



Photo Penna. Game Comm.

*Small rodents, such as mice, rats, red squirrels, gophers, etc. constitute a "buffer" for game.*

quence. In some cases there may be a measure of truth in this contention, but in general our field observations indicate that the theory is unsound so far as Southern quail preserves are concerned. Here an abundance of the rats [cotton rats] attracts an abundance of enemies to prey upon them. Red 'chicken snakes' (red colubers) and other snakes, which prey upon rats regularly and quail eggs incidentally, are usually found in the most 'ratty' places, while the abundance of marsh hawks in any particular locality seems directly in proportion to the number of rats, or their availability. The same holds more or less true for skunks, homeless cats, and others.

"Hence if the quail preserves are kept as free of rats as possible many of the creatures that are attracted primarily by the rodents, but damage the quail incidentally, will consider the area poor hunting-ground and confine their efforts to places where the rats are abundant. This happy hunting-ground may well be on the lands of others outside the confines of the preserve."

Stoddard found that this particular buffer (the cotton rat) destroyed more quail eggs than any other predator in the South.

In speaking of the same region, Errington (1938) postulates: ". . . On the upgrade of their cycles, un-

controlled cotton rat population may become so numerous as to attract and perhaps build up locally populations of predators that destroy many quail incidentally. When the cotton rats rapidly decline under such conditions to the extent that they are no longer readily available as a staple food for certain types of predators, these predators, in turning to other sources of food, may seriously affect bobwhite populations . . ."

Komarek (1937) agrees with both Stoddard and Errington: "As Stoddard brought out in 1932, my studies indicate that a high population of small mammals is not necessarily a buffer against predators but conversely that such a population not only attracts but builds up a higher predator population. Food is considered by most game research men to be one of the main criteria for building up a game population; why not a predator population?"

And Darrow (1945) found ". . . Thus it seems that when a low abundance of buffers, their staple food supply, forced foxes to cover the area more intensively to get enough to eat they happened onto and destroyed a greater proportion of the grouse nests present."

The subject of buffers is nicely summarized by Leopold (1933): ". . . It is obvious that in the ag-

gregate they act as buffers to divert the attention of predators and satisfy their food requirements. This benefit is partially offset, however, by the fact that most of them compete with quail for food, while some of them (for instance, spermophiles) are themselves possibly predators on quail, in that they eat eggs and possibly chicks. There is still another possible offset to the beneficial effect of buffers: they may, provided they are more abundant than elsewhere, act as "bait" which induces an influx of mobile predators. Furthermore, some buffers harbor the diseases of game, and many the diseases of predators. Lastly, hibernating buffers are unavailable to most predators during the winter, and nocturnal buffers are not available to diurnal predators, or vice versa."

Similar to the effect of hibernation, high mouse populations, which may have attracted many predators, may become unavailable during periods of deep snow and thus throw the predator pressure normally absorbed by them onto small game which, because of the sparsity of protective cover, is at these times most vulnerable to predation.

Failure of buffer (perhaps a misnomer in this region) populations in the far North (snowshoe hares and lemmings) may: (1) cause the mass starvation of certain predators; (2) throw undue pressure upon grouse and ptarmigan; or (3) cause an emigration of predators to other regions. This is the principal cause of goshawk and snowy owl "invasions" into northern United States. When these invasions occur, the native game of these states may suffer abnormal losses. The high mortality of ruffed grouse to emigratory goshawks is well known.

#### The Effect of Prey Populations Upon Predator Populations

Since predators are primarily dependent upon prey animals for food

and consequently for survival, any failure or scarcity of this supply is certain to produce much the same results as a similar scarcity of food would for herbivorous animals.

Such far northern predators as the Arctic fox, snowy owl, goshawk, and Canada lynx may suffer moderate to severe mortality when the "crash" of the lemming and snowshoe hare cycles coincide and the available food is reduced to almost nothing. This fact is substantiated by the records of the Hudson Bay Company. Because of their greater mobility, goshawks and snowy owls may emigrate southward until they reach a new food supply. In temperate climates where prey species are far more numerous, the temporary scarcity of a cyclic prey animal merely means a temporary diversion of its predators to one or more other prey species. Emigration may even occur, but the extent of this may be no more than a few hundred yards or a few miles as compared to the many hundreds often traversed by snowy owls and goshawks during food depressions.

Besides the possible starvation or forced migration of northern predators, there is another important way in which the supply of prey may affect predaceous animals—the physiological effect upon reproductive success. Gross (1947) explains this relationship: "It is now generally accepted that the underlying cause of Snowy Owl invasions is the well-known cyclic fluctuations in the lemming and mouse populations.

"The lemmings increase over a period of three to five years—an average of approximately four years—from a low ebb to a maximum. The year of maximum abundance of lemmings is also a good year for the predators. The Snowy Owl fits into the picture somewhat as follows. The owl lays from six to eight eggs, and some nests have been found to contain as many as thirteen. When



Photo by Hal Harrison

When the periodic shortage of prey animals occurs in the Arctic and Sub-Arctic, the snowy owl may emigrate as far south as northern United States.

the eggs hatch, it requires a tremendous amount of food to feed such a large family. Ordinarily the mortality is great, with only two or three of the owlets reaching maturity. If the lemmings are scarce, the owls may not even attempt to nest. In a good lemming year, practically all of the large families survive, and thus the snowy owl population is built up to a peak along with that of the lemming. The same might be said of the other predators. Then with abruptness the 'crash' comes.

"The predators such as the foxes and the Snowy Owls that depend primarily upon lemmings for food must do one of two things—they either starve to death or they must find other sources of food. The foxes are able, by their cunning and adaptiveness, to secure other food, but many of them die of starvation and disease as the Hudson Bay records clearly indicate. The Snowy Owl, however, since it is able to fly, wanders far and wide, in years of extreme general scarcity of lemmings, even coming down as far as northern United States. It is clear that the migration of the owls is due to two factors: first, the great increase of the Snowy Owl population; and, second, the abrupt disappearance of their chief food, the lemmings.

"Other predators of the lemming also exhibit, though not in such a spectacular way as does the Snowy Owl, the influence of the lemming cycle. Gyrfalcons, Rough-legged Hawks, Short-eared Owls, Ravens, Shrikes, and others have usually been noted in increasing numbers during the times of the Snowy Owl invasions. The lemming cycle exerts a profound influence on the ecology of the Arctic barrens. It is not only the basic cause of periodic migrations of predatory birds, but it also vitally affects the furbearing animal and thus the whole economy of the Arctic fur industry."

Elton (1927 and 1942) has recorded other instances of food shortage limiting the reproduction of predatory animals: ". . . the short-eared owl (*Asio flammeus*) may have twice as many young in a brood and twice as many broods as usual, during a vole plague, when its food is extremely plentiful." And Manniche (1910) in writing of the mammals and birds of Greenland reported that skuas and snowy owls breed chiefly or solely during the lemming maximum.

#### A Comparison Between Predation and Other Factors Causing a reduction In Prey Populations

Of all the perplexing ramifications of the comprehensive subject under discussion, perhaps the relationship between predation and the other factors controlling the size of animal populations is the most complex and least understood of all. Why are some species exceedingly numerous and others extremely rare? How can one animal with a low reproductive capacity occur in large numbers while another on the same range and blessed with an almost unlimited fecundity is barely able to survive? What are the effective reducing factors for each population or population fragment? There are many of these controls, including predation, and the problem of deciding which one is most effective at a given time and for a given population is indeed a test of superior knowledge and wisdom. Our task here is to examine the meagre information available and attempt to appraise the relative importance of each of the several restrictive forces in terms of animal survival.

That these forces do exist and are constantly in operation is accepted fact, and according to Southern (1948): "It must quickly become clear, if one considers the enormous potential increase of any animal, not only that mortality on the same high

scale must be operating (which is important for the evolutionist studying the working of natural selection), but that the operation of this mortality must be extremely precise to keep a population relatively steady in numbers from year to year. If an animal which increases by 100 each year is reduced before its next breeding season by 99 instead of by 100, this small discrepancy will generate an astonishing increase in a few years."

But before beginning a discussion of population controlling factors, it might be well to clarify the meaning of "control" as here used. Nicholson (1933) has differentiated between decimating or reducing factors and true controlling factors: (from Southern, 1948) "Nicholson formulated clearly the idea that, while many mortality factors operated on a population, only those whose pressure automatically increased with increase in the size of the population could be said to be controlling that population. A hard winter will not kill animals in proportion to their total numbers, and, therefore, although more may die from this cause than from any other, it cannot be said to control them. Predation, on the other hand, will vary in intensity with the numbers of the prey and may be said to control them. In Nicholson's phrasing, predation is a density-dependent mortality factor. These factors can be classed in three broad categories—availability of food, disease, and predation (of which parasitism may be considered as a special form)—and all other kinds of mortality are density-independent and, as such, unable to control the animals upon which they act." The writer feels that *emigration* should be added to the list of density-dependent factors. Elton (1927) attests to the importance of this factor in population decrease.

Nicholson explains this hypothesis as follows: "We will suppose that the animals in a certain population would increase one hundredfold in each generation if unchecked, and also that, on the average, climate destroys 98 per cent of the animals. It is clear that the number of animals would be doubled in each successive generation if no other factors operated. Climate could never check this progressive increase, for it would continue to destroy only 98 per cent, its action being uninfluenced by the density of the animals. If, however, there is some other factor, such as a natural enemy, the action of which is governed by the density of animals, the destruction of the remaining 1 per cent, necessary to check an increase, would soon be accomplished. If this example were observed in nature, one would be tempted to conclude that, because climate destroys 98 per cent of the animals while the natural enemy destroys only 1 per cent, the limitation of the population is mainly due to the influence of the climate. However, it is clear that the natural enemy is wholly responsible for control, because climate, by itself, would permit the density of the population to become indefinitely great."

Southern (1948) shows that animal population levels may vary in accordance with the particular control factor operating: "Consideration of the work described above brings us to the conception that the steady density of any animal may vary not only with environmental changes (e.g. by a direct or indirect alteration in the searching efficiency of the predator, which may be controlling it), but may be set at widely-varying levels according to the particular control factor operating. An example of this is seen in the population changes which have been recorded for forest species of deer in America. Destruction of predators re-

sulted in the deer escaping completely from their control and multiplying enormously until they reached a new steady density in relation to their food supply—with disastrous economic repercussions. It is probable that many animals that show occasional ‘mass increases,’ whose economic importance is emphasized by the designation of plagues, have escaped from the control of predators or parasites and are reaching up to a new level set by the availability of food . . .”

The population levels as set by the four principal controlling factors—disease, emigration, predation, and food supply—can be shown graphically (Fig. 2). The levels shown, although of course varying widely in amplitude from the average or mean, may be applied to both cyclic and non-cyclic species, providing both exhibit irruptive tendencies and are subject to epidemic disease or mass emigration. A to B indicates the normal, expected increase of a population which has started at any low point; B to C is the more or less constant level corresponding reasonably close to Errington’s “carrying capacity.” Not always, but often, predation is the primary controlling factor at this level. Many so-called non-cyclic species may remain at this level for a number of years, with constant fluctuations above and below the line as fixed by weather and other density-independent factors. Many game species appear to occupy this level more or less permanently. C to D represents the “irruptive” phase of population increase when, for some reason, a species may escape from the control of its natural enemies and reach a new level (D) set by the availability of food. Sometimes this escape may occur when the predator pressure is decreased, as in the example cited above of deer in America, or when the reproductive rate of the prey species, because of unusually favorable condi-

tions, may suddenly greatly exceed the loss from predation. D to E marks the level set by the food supply, subject to the same variations in amplitude from density-independent factors. E to F denotes the “crash” phase which so regularly follows an irruption of numbers. In some species this may be terminated by disease, but in others, especially where plague proportions are reached, the “crash” may come as the result of mass emigrations. What initiates this decline is still somewhat obscure; sometimes the food supply is literally exhausted, and starvation, coupled with decreased reproduction, causes a decided slump; in other cases, epidemic diseases appear to strike when a certain population density is reached; and finally, emigration seems to occur more as the result of overcrowding than of a failure of the food supply.

It can be seen from the above discussion that predation, at least in most instances, occupies a median position between the food supply and disease (or emigration) as a population controlling factor. The food supply is ordinarily the least restrictive, predation is next, and disease (or emigration) causes the greatest reduction.

But if one does not differentiate between density-dependent and density-independent factors, predation becomes a far less important population-suppressing factor. Gabrielson (1941) says: “Every careful study that has been made of the relationship of predators and small-animal populations indicates that predation is not the major limiting factor upon the total populations of these species. In almost every case investigators have ranked predation as subordinate among suppressive agencies.” And Nagel (1949): “. . . There’s the fact (that we’re just beginning to appreciate) that when predation becomes the chief factor

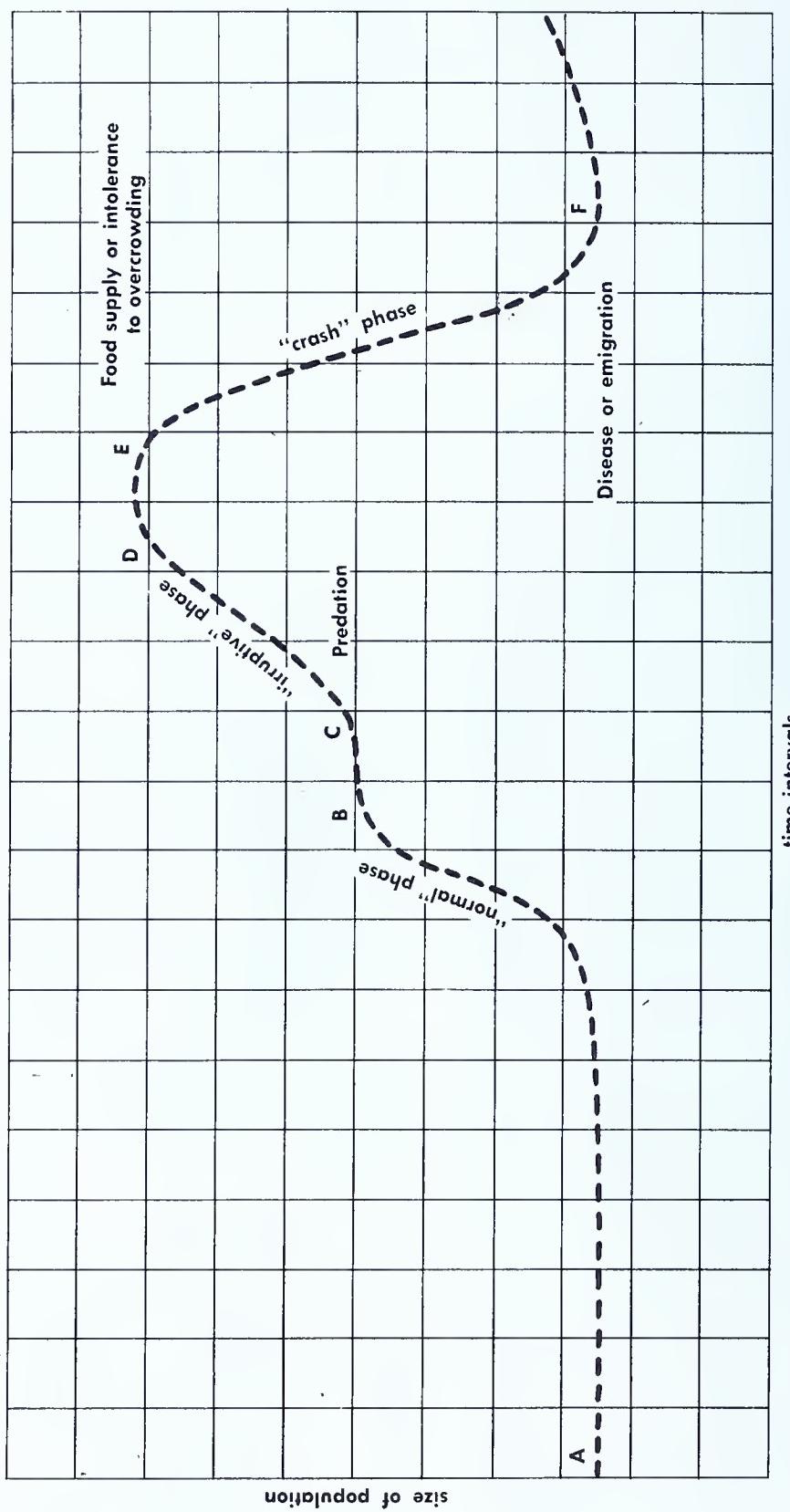


FIGURE 2  
A Comparison Between Predation and Other Factors Controlling Prey Populations

in wiping out a game species, that species has outlived its environment."

Bennitt and Nagel (1937) have proposed two generalizations concerning predation and other controlling factors:

"(a) . . . decrease in predation is not accompanied by a corresponding increase in the prey species, except up to a certain point fixed by other factors such as food, cover, and breeding facilities.

"(b) . . . increase in predation is not accompanied by a corresponding decrease in the prey species, except down to a certain point fixed by the same factors."

Naturally, general statements like these are decidedly indefinite, because the difference between the population level set by predation and that fixed by any one of the other factors mentioned might be insignificant or it might be great. And again, the writer would like to stress that for most prey species, the population level fixed by *cover* is nearly identical to that set by predation.

Quantitative measurements of mortality from predation as compared to total mortality from all causes have been few in number. Tinbergen (1946) measured the mortality suffered by four species of small birds from the European sparrow hawk (*Accipiter nisus*) and compared this loss to the total expected mortality

for each species. From the review of his work by Hartley (1947): "In the Hulshorst-Heiden area, where the figures are most complete, the expected total mortalities of House Sparrows in the months of May and August were 302 and between 678 and 833 birds. The deaths due to Sparrowhawks were 106 and 331, the latter figure being nearly 50 per cent of the lower limit of expected mortality. In the chaffinch in May the expected mortality was 170 birds, and 55 were known to have been killed by Sparrowhawks. In the two titmice the expected mortalities and the number of birds which fell to hawks are shown below:

	May	June 16
	Sept. 15	
Great Tit		
Expected .....	210	2,906
Killed by Sparrow-		
hawks .....	93	529
Coal Tit		
Expected .....	357	5,569
Killed by Sparrow-		
hawks .....	132	138

"On the basis of these data and of results from another sample area (Ermelo) it is concluded that the attacks of Sparrowhawks are the cause of at least half the summer mortality of House Sparrows; of about a quarter of the mortality of Chaffinches and Great Tits; and of only a small percentage of the deaths of Coal Tits."

## THE ROLE OF THE PREDATOR IN WILDLIFE MANAGEMENT

### Arguments Opposing Predator Control

(1) *The "balance of nature" concept.* One of the most widely-used arguments in opposition to predator control is that these animals are essential in maintaining a "balance of nature." The proponents of this concept insist that, without this balancing effect or counterforce, many injurious animal forms would increase at such a tremendous rate

that the very existence of man would be jeopardized. Also, they contend that beneficial forms, unless held in check, would outgrow their food supply and eventually succumb by starvation. Thus, they visualize a harmony, a sanguinary relationship to be sure but harmonious nevertheless, among wild animals in which populations are maintained at a more or

less constant level. These levels are believed to be somewhere near the biological optimum for the various species.

What is the viewpoint of the ecologists on this subject? "The environmental changes wrought by civilized man are often much more rapid [than nature]. In a few decades we destroy vast forests, bring under cultivation thousands of square miles of prairie soil, carry water into arid regions for irrigation, drain great swamps and lakes; destroy immense herds of bison or other mammals, or myriads of pigeons, obliterate the hiding and nesting places of many species and reduce their food supply; introduce various other species, such as cattle, sheep, English sparrows, etc., to provide competition for native species of animals, and grains and other plants to provide competition with native plants and to furnish new, different and perhaps better food supplies for some of the native animals. In many other ways we disturb the balance that has been established. Such rapid transformations in the environment introduce many complex and difficult problems, the correct solution of which requires an accurate and comprehensive knowledge of all nature, and taxes the wisdom of the best-informed naturalists; yet men with very little knowledge of nature consider themselves quite competent to decide all such problems very promptly. The tendency of nature is not always to restore the former balance, but sometimes to establish a new one." (Henderson and Craig, 1932)

Southern (1948) concurs: ". . . A favorite thesis was that destruction of predators interfered with a mystic 'balance of nature,' and, though it was not clearly stated how this balance was achieved and maintained, it was nevertheless strongly asserted that tampering with it must bring disastrous results.

"A little thought will show that whatever balance may exist in populations of British animals, it is not a 'natural' one in the sense that it represents a prehistoric condition, since cultivation and settlement have already turned any such condition upside-down. Furthermore, as Elton was one of the first to emphasize, some animal communities live in a condition of continual and violent oscillation of numbers. Such fluctuations may be rhythmic (e.g. snowshoe hare, lemming, etc.) or they may be aperiodic (e.g. house-mice, defoliating caterpillars, etc.), but they are undoubtedly natural, since they are a marked feature of the least disturbed of the world's vegetation zones, namely Arctic tundra."

Elton (1930) is even more emphatic: "The 'balance of nature' does not exist, and perhaps never has existed. The numbers of wild animals are constantly varying to a greater or less extent, and the variations are usually irregular in period and always irregular in amplitude. Each variation in the numbers of one species causes direct and indirect repercussions on the numbers of the others, and since many of the latter are themselves independently varying in number, the resultant confusion is remarkable."

And Goldman (1925) views the lack of balance in terms of human economy: "However, man has already so profoundly disturbed the equilibrium throughout the civilized world that he must ultimately assume effective and intelligent control of all wild life, utilizing natural enemies of injurious species so far as possible, but keeping them under his direction and supplementing them by all the various artificial agencies at his command."

(2) *The "sanitation effect" and the maintenance of sporting qualities in wild game.* Predators are believed to perform a valuable service to prey species by eliminating the diseased,

crippled, and unfit thereby contributing to the health, physical stamina, and perhaps the survival of the species. Also, because the unwary, slow, and stupid individuals are killed most easily by predators, and are thus eliminated as fast as they are born, the sporting qualities so desirable in a game animal are believed to have developed as a result of this selection.

Nagel (1947) defends this point in favor of predators by saying: "Predation is nature's way of doing for the wild creatures what culling, sanitation, and selective breeding do for tame flocks and herds. This is true of game as of other species. It is the way by which game maintains the sporting qualities of strength and wildness that make hunting and fishing so worthwhile." And this same view is reiterated by Taverner (1939): "The natural predator by unconscious selection captures, on the average, the weaklings and least efficient. Thus both help to build up the constitutional stamina and resistance of the residue by the elimination of the unfit. The sportsman on the contrary endeavors to take the best of the hunted—the largest goose, the highest plumaged bird, the deer with the greatest antlers or the biggest and finest bear, leaving the culls to perpetuate the species.

"The conclusion seems plain that the predator occupies an essential position in the scheme of nature that cannot be replaced by any other agency: that probably one of the greatest disservices man can do for the game he hunts is to destroy his rivals, the predators, the agents that exercise the only selection that compensates for his own deteriorating influence."

And according to Grange (1949): "It has been proved beyond doubt that injured, weak, diseased, incapacitated and subnormal individuals succumb to predation ahead of the strong and healthy individuals. Not

*all prey taken by predators is subnormal.* Any such conclusion would be erroneous and at variance with field experience. But among the individuals which are captured and killed by predators are many if not most of the incapacitated animals if a reasonable population of predators is present. To a certain extent, therefore, predation is selective. In eliminating diseased prey individuals, predators not only feed themselves but afford some protection to the prey species itself."

But even on this point, which at first glance appears to be an indisputably beneficial effect of predation, there is not complete accord. Gabrielson (1941) comments: "One statement frequently made is that predators render a useful service to game species in destroying sick and weak animals, thereby helping to maintain the vigor of the stock. There is not much definite evidence to substantiate such assertions, although they are widely advanced as a reason for the protection of predators."

In the same line of thought, Goldman (1930) says: "Another idea that appeals to some, and may even be accepted as demonstrated truth, is that predatory animals are an essential part of nature's plan to eliminate the unfit and maintain wild life at a high physical level. My observations in the field have led me to the conclusion that this alleged beneficial effect of predatory animals may be greatly exaggerated, although having to cope with predatory animals may have had some bearing on the evolution of a race. In modern human society medical science and care lavished on the unfit may cause deterioration of the race, but the conditions that must be met by wild life tend to eliminate the unfit in any case. Many insular species, beyond the reach of predatory animals, appear to be as physically fit as their mainland relatives.

Even the assumption that predatory animals more often attack the unfit should be examined with care for we find in the field much evidence that the strong and healthy as well as the weaker animals are killed. Some have advanced the theory that sick animals and birds are singled out and killed by the predators, but such individuals are apt to be motionless and therefore overlooked as it is motion that quickly reveals location."

And Marston (1942) in his study of bobcat-deer relationships reveals that ". . . The toll is not limited to young or weak individuals; some cats perhaps kill wantonly more deer than they can utilize. . . . Smaller bobcats are fully as harmful to deer as larger ones. Bobcats are not selective in hunting; ordinarily they kill any deer they are able to approach."

The writer can list at least three additional refutations to the value of the sanitation and culling service: (1) Especially during severe winters when a food shortage caused by deep snows or ice storms may weaken game animals so that they become more vulnerable, predators may kill many individuals which would have otherwise survived the period of "fast" and recovered fully. (2) Part of the sanitation effect is nullified by the spread of rabies, mange, tularemia, and perhaps other diseases to prey populations. (3) There is considerable doubt that the admirable quality of "wildness" in game animals comes solely or entirely from the constant harassment by generation after generation of predators. Ruffed grouse in central Canada show little or no fear of man and lack the sporting qualities of grouse in the United States in spite of the fact that they have been subjected to predation throughout their existence. Early colonists reported similar behavior for the wild turkey. Evidently man is the most powerful

force in developing a "sporting" game animal. It was *his* constant harassment which has made the grouse, the wild turkey, and the deer truly "wild" in the sporting sense.

(3) *As an aid in the control of rodents.* No one can deny that predators kill and eat many, many millions of harmful rodents each year, and, in so doing, perform a vital service to humanity. The total value of this accomplishment, if reckoned in dollars and cents, would certainly amount to several, or many, millions of dollars. Therefore, no one disagrees that *certain* predators perform a valuable service in reducing the populations of *certain* rodents. But, like all other generalities concerning predators, there are many who disagree that predators successfully control rodent populations even though those who champion predators vehemently state that they do. There are others who feel that the good accomplished by certain predators in reducing rodent populations is more than nullified by other, non-beneficial activities and that certain rodent species are beneficial in themselves and should not be subjected to serious reduction by predators.

Chitty (1938) points out the outstanding efficiency of the short-eared owl in catching mice but shows that, in spite of this constant drain, mouse populations are little affected: "It is concluded that in one year a Short-eared Owl would certainly eat more than 47 lb. of voles or mice, and probably more than 95 lb. but less than 142 lb. This represents a consumption of food animals that may roughly be stated at  $2,000 \pm 50$  per cent.

"For a certain area on the Scottish border census figures are available of the Shorteared Owl and vole populations in April, 1933. It is shown that the daily requirements would be met by 0.02 to 0.05 per cent of the vole population. . . . it seems unlikely that at the densities under



Photo Penna. Game Comm.

*Large predators, such as the coyote, have been found ineffective in the control of rodents.*

consideration the total predation would act as an appreciable check upon the vole population."

Elton (1927) cites other figures: "In 1907, a plague of *Microtus* completely destroyed 15,000 out of 20,000 acres of alfalfa in Nevada. It was estimated that there were 3,000 birds of prey and carnivorous mammals at work in the plague district, that these would be destroying about a million mice or more every month, and that this made no appreciable difference to the numbers." Pearson (1947) provides further figures: "If each pair of owls covers about one square mile (Griscom, 1942) or 640 acres, then at the average rate of 3.2 mice or shrews caught each night these owls would be reducing the prey population at a rate of more than 1.8 animals per acre per year. This amounts roughly to about 10-20 per cent of the average prey population at any one time."

Evidence of the inefficiency of predators in controlling rodent populations is also presented by Sheldford (1942): "There are numerous instances where predators, such as the coyote, have remained unmolested and yet the ground squirrel, prairie dog, and jack rabbit problem on these areas have been alarmingly acute. There are areas where rodent populations have been reduced by artificial means almost to the vanishing point and yet, despite the fact that native predators were left alone, the recovery of the rodent population was rapid."

Couch (1928) adds: "While there is no doubt that predatory mammals are a factor in controlling rodents, yet they play but a small part in maintaining the natural balance. Larger factors are involved, and these include seasonal conditions, fecundity of the species, the acts of man in providing abundant food, and the presence of natural and other shelter. On the other hand, rodents the size of ground squirrels, or smaller, are

more effectively decreased in numbers by raptorial birds than by predatory mammals. The quantity of rodent remains found in the stomachs and disgorges of individual owls is almost unbelievable.

"Townsend ground squirrels (*Citellus townsendii*) were observed to be exceedingly numerous in the spring of 1927 near La Crosse, Washington. One tract of ten acres was treated with poisoned grain, and two and one-half hours later, 1,132 squirrels were picked up, and three days later 574 dead squirrels were counted on the same field. The presence of coyotes, weasels, and badgers was particularly noted in this section. Two coyotes left the field on the first visit, at least 20 weasels were seen, and badger diggings were plentiful. Hawks were scarce over the entire section.

"The foregoing, though based on limited observations, may indicate that the value of predatory mammals in controlling injurious rodents has been over-estimated, but that birds of prey may be more important factors in bringing rodent pests under control."

Horn (1941) emphatically states: "On all the areas we have studied intensively in California, we have not obtained one bit of factual data which indicates that rodents or rabbits have increased following removal of the coyote." And Poole (1933) agrees: "At no time does it appear that the coyote has applied itself to intensive pursuit of these animals [rodents] or served in any manner as an appreciable control agent."

Whether predators do or do not control rodents, there is another side to the question which is seldom considered. Not all rodents are harmful, and the killing of beneficial species or individuals by predators can be counted against them. For instance, Hardy (1946) describes the benefits of the pocket gopher: "Of the ap-

proximately 246 races of animals reported to occur in Utah, 177 or 72 per cent are rodents, of which a great number are beneficial. One of these which is a pest in the garden, but of untold value in our rangelands, is the pocket gopher. Grinnell of California calculated that annually the pocket gophers in Yosemite move 3.6 tons of earth per square mile to the surface. Burrowing rodents such as pocket gophers form soils because the subsoil is broken and brought to the surface where it is exposed to faster weathering and helps to build our fertile topsoil; weathering of the substratum is hastened by the water and air which enters rodent burrows; snow melts more slowly on porous ground than on hard-packed earth, allowing the water to percolate underground where it adds to sustained flow of trout streams instead of contributing to spring floods; the porous moist soil produces a thicker plant cover which favors water conservation and supports game and livestock; rootlets are better able to penetrate the earth and bring minerals to the plant body which are later stored in the valuable topsoil when the rodents cover the vegetational debris on the surface with earth.

"In the dust bowl of Oklahoma, recent studies show that the greater imperviousness of soils in heavily over-grazed areas is both cause and result of the absence of pocket gophers. Other investigators report that in the deserts of Arizona, pack rats and kangaroo rats change both the physical and chemical nature of the soils in which they live. Each kangaroo rat annually adds to the soil plant nutrients, especially nitrates, that would cost about 30 cents to apply in the form of commercial fertilizer. The function of rodents is thus to fertilize and plow the precious topsoil which supports plant and animal life."



Photo by Maslowski & Goodpaster

*Predators destroy millions of mice annually but do not always effectively control their numbers.*

At least two of the larger rodents (muskrat and beaver) are among the most valuable of furbearers, and in the East the wood chuck is considered an important game animal. Additional investigation might reveal beneficial activities yet unknown of other rodents presently classified as injurious.

There are many biologists who believe that other factors are far more effective in controlling rodent populations than predation. Among these factors could be listed climatic forces, diseases, parasites, emigration, food supply, and man's own efforts at con-

trol. Goldman (1925) postulates: "It has been asserted by some that predatory mammals exert a beneficial influence in preying upon rodents, thus preventing their abnormal increase and maintaining the natural balance. It is true, of course, that the smaller carnivores, including the valuable furbearers we wish in general to protect, feed extensively upon rodents and thus tend to reduce their potential rate of increase; but there is much evidence that two other important factors limit the number of many rodents. These are, and always have been, the available food supply and epizootic diseases. It is a well-established fact that many rodents tend to increase in numbers locally until visited by periodic outbreaks of disease, which may leave only a few individuals where thousands had previously existed.

"If the food supply is abundant many rodents multiply amazingly in spite of the inroads of predatory mammals. . . . The excessive abundance of rodents in many places under varying environmental conditions forces the conclusion that predatory mammals alone are ineffective in controlling their numbers."

Clements and Shelford (1939) present still another theory: "Let us assume that mice die of old age when about three years old. A favorable year may lead to a saturation of available space. Survival of young will then be limited to the space left by accidental deaths of 'favorable-year' individuals and migration out of the area. In the third year, at a time when reproductive capacity is reduced by senility, more than half of the mouse population dies of old age, causing a sharp decline. Recovery could start only the following year. This hypothesis cannot be tested until some method of ascertaining the age of mammals is determined."

The final consideration in a discussion of predator-rodent relationships

is that predators may kill animals which might be better "mousers" than the predator itself. Eadie (1944) in a study of the short-tailed shrew (*Blarina*) discovered that 56 per cent of 200 shrew scats analyzed contained mouse remains (almost entirely *Micrurus*). He states, "The fall population of *Blarina* on this type of habitat was conservatively estimated at three per acre on the basis of trap-removal quadrat studies. Short-tailed shrews might thus have accounted for at least 14-27 mice per acre during the winter months. Circumstantial evidence points to a higher figure. If this represents actual predation, it is of considerable significance in the local microtine cycle."

Perhaps the tiny shrew, working 24 hours each day, kills more mice than many of the hawks and owls, but, because its good deeds cannot be observed and its services lack the glamor of the swooping hawk, it has few defenders among the "protectionist" group. Even though it may be one of the most beneficial of all animals because of its diet of insects and mice, food habits analysts commonly list it with mice and other harmful rodents in evaluating the good and bad qualities of a predator.

(4) *As an aid in the control of insects.* Predators undoubtedly do consume vast quantities of insects and in so doing may aid in some small measure in the control of these invertebrates, but it is illogical to think that predatory animals are an important factor in the control of insect populations. It is true that skunks may dig insect larvae from the ground and help save grass, clover, alfalfa, or other forage crops, and that other predaceous animals may accomplish much good on limited areas. At any rate, it is safe to say that this feeding tendency is a desirable one and should add to the economic value of insectivorous predators.

Several economic biologists warn

that this service should not be over-emphasized. McAtee (1913) states: "When we consider the degree of insect control necessary to the commercial success of crops, it is evident that man must almost invariably depend upon his own efforts. We must know about natural enemies, give them all due credit and protect them, but we must beware of exaggerating their services. People are too easily misled in this direction, but the final result of too great faith in natural enemies is disappointment."

And Gabrielson (1941): "For example, enthusiastic bird conservationists are prone to exaggerate the value of the insect-eating habits of birds [includes all birds, not just predaceous birds] and their practical benefit to the human race. There is no question that the insectivorous birds on this continent consume enormous quantities of insects, and impressive figures showing the number or volume thus consumed, based on accurate measurements of stomach contents, can be quoted to show how many insects are destroyed in a given period by an individual bird or by the total population of birds on a certain area. Statements of this nature, coupled with the assertion that insects would entirely destroy the sources of human food if it were not for the birds, tend to present erroneous impressions that are not based entirely on fact. Entomologists generally consider that adverse climatic conditions, parasitic insects, and diseases are factors of more value in controlling insect populations than are birds, and they produce considerable evidence to support their position.

"Regardless of which may prove to be the correct view of this complex and intricate relationship, it is certain that the insectivorous proclivities of birds are one factor in controlling insects—probably most effective in slowing up an increase in numbers when insects have been reduced

numerically by other means—and that because of the pressure thus exerted, the birds should be left to pursue that avocation unless they otherwise adversely affect man's interests."

As in rodent control, predators by killing shrews, moles, small birds, and other prey, may be removing animals which individually are more capable of consuming larger quantities of noxious insects than the predator itself. It is almost certain that the several to many shrews which may be killed by a red-tailed hawk each year will take many times more destructive insects than the few grasshoppers and caterpillars consumed by the hawk in late summer and early fall. In the long run, predators as a group may actually be a factor in the prosperity of insect populations.

(5) *Fur value.* It is estimated that the fur trade at its peak in the United States had a value of approximately \$100,000,000 annually. However, at present prices, the value probably averages nearer \$50,000,000. Of this figure, one-half or more would probably arise from the sale of the furs of carnivorous mammals. In other words, even at present prices, predatory mammals provide an annual income of at least \$25,000,000 for trappers and hunters of the United States and many millions more for tanners, furriers, and retail merchants. This is a big industry, and is unique in the sense that the income is distributed among so many thousands of people of all ages.

Few who object to the control of predators can find fault with a legitimate and managed annual take of furs. They can, and do, object to the taking of fur animals in large numbers at times when the fur is unprime. Of course, it is often necessary to remove an individual furbearer which may be killing livestock or destroying game, but large-scale destruction of these valuable animals

during off-season vermin control campaigns by sportsmen's groups or by concerted trapping or hunting for bounty appears to be an inexcusable waste of a natural resource. However, this apparent truth is often tempered by economic conditions. At the present when long-haired fur-bearers such as foxes, coyotes, bobcats, raccoons, skunks, opossums, and others, are almost worthless on the fur market, it may be a worthwhile sacrifice to eliminate the excess of these populations at any season to alleviate losses to game and livestock.

When the incentive of high fur prices is lacking, other means may be necessary to keep some carnivorous animals within reasonable bounds.

At least there is almost universal agreement that the bulk of all fur-bearers, under ordinary conditions, should be harvested when the fur is prime by trappers and hunters who are remunerated only by the value of the fur and the recreational pleasures they receive. If properly managed, and if fur prices remained good, the fur harvest should continue at a high level. The populations of pred-



PGC Photo

*The recreational value of predators cannot be overemphasized. Crow shooting is enjoyed by thousands.*

ory mammals should be sufficiently reduced before the breeding season so that game and other valuable wildlife can reproduce in comparative safety.

(6) *Esthetic and recreational values.* In the final analysis there may be little difference between pleasures designated as "esthetic" and those derived from recreational enjoyment when the stimulation in either case comes from the sights and sounds of nature. Esthetic pleasure suggests a more passive participation while recreation infers a certain degree of activity as hunting, fishing, trapping, photographing, etc.

The esthetic appeal of wildlife (predatory or otherwise) may be most manifest to those who know the meaning of the word, but even those who can neither spell nor define it perceive the beauties of nature and are thrilled by them. Whether animals excite the "ohs" and "ahs" of a society matron or the slow grins of backwoodsmen, the pleasures are heartfelt and truly esthetic in character.

Any time spent in the outdoors whether it be an automobile trip, a picnic, a few hours of fishing, or even a walk in the woods, is enhanced by the sight of wild animals. Deer hunters in the East are often more intrigued by the appearance of a wildcat or fox on the "drive" than by the sight of a buck. Deer are common and lack the esthetic appeal that the wildcat possesses because of its comparative rarity. The lucky Nimrod who gets to see a bobcat is the envy of the camp.

Deck (1938) aptly describes the esthetic appeal of predatory animals: ". . . It seemed odd that sporting tradition should decree death for every creature that might sometime eat a game-bird or fish. For modern men don't hunt for meat—they go to the market. They go afield for the fun of the thing. They like plenty of shots, of course, (though most of

these may as well be missed) but mainly they want to see wild things. And strangely, while workaday game may flush and fall and be forgotten, a man remembers for long his glimpses of nature's drama played by the birds and beasts we've been taught to hate as vermin."

The recreational opportunities offered by predatory animals is nearly limitless. Hunting heads the list of these activities. Some predators are hunted partially for profit and others almost exclusively for sport. Many thousands, from the wealthy red-coated hunter riding to the hounds to the mountaineer who "runs him for his hide," are champions of the fox chase. Other thousands insist that there is nothing to equal the nocturnal sport of 'coon hunting. The coyote is coursed with fleet-footed greyhounds and wolfhounds and is a favorite target of the "varmint" hunter equipped with a high-powered rifle and 'scope. The bobcat and mountain lion are "treed" with hounds. The skunk and possum, especially in the South, are a source of much pleasure for night hunting. The crow also has its following, and millions of rounds of shotgun ammunition are expended by those who delight in this superb wing shooting. A few woodsmen have learned to call horned owls, foxes, coyotes, and hawks and pursue this sport with all the enthusiasm of a hunter calling wild turkeys.

Trapping is another form of recreation made possible by predatory animals. Some trap almost exclusively for the monetary return, others trap partially for profit and partially for recreation, and a great many are motivated principally by the recreational benefits. Fur animals provide a type of recreation which is healthful, enjoyable, educational, and profitable.

Still others derive considerable gratification from photographing wild predators. Many are content to

while away the hours observing their habits and homelife.

So whether one is vigorously pursuing a fox at full gallop or merely lying peacefully on one's back in the warm summer sun watching the lazy circling of a hawk against the sky, the enjoyment is real and the satisfaction tangible. *This is an undisputed blessing provided by predatory animals.*

(7) *Scientific values.* Dice (1925) makes it clear that predatory animals are equally as important from a scientific standpoint as non-predatory forms. He says: "Any species of animal which is the sole living representative of its group is of great scientific importance as being a unique type. On the other hand, all the species and subspecies which together constitute a series of closely related forms are also of high scientific value, for, by the critical study of such groups of closely related forms, we can secure important evidence about the process of organic evolution and about the factors concerned in causing evolution."

Later he adds: "The lives of all species of animals living in one locality are closely interrelated; especially close are the relations between the carnivores and the forms on which they prey. All of these associated forms, predatory and non-predatory alike, have evolved under mutual adjustment, and all of these associates must be considered together in any attempt to explain evolution or distribution. With the predatory mammals eliminated it will become more difficult to explain the origin of many adaptive structures and habits in the remaining species.

"The explanation of the facts of evolution and of distribution are among the most fundamental problems of biology, and for their solution we shall need the greatest completeness of knowledge about all possible kinds of animals. The world,

therefore, cannot afford to permit the elimination of any form of wild life without the most urgent economic reasons, as determined by the most careful investigation.

"I do not advocate that predatory mammals be encouraged nor permitted to breed everywhere without restriction; but I am sure that the extermination of any species, predatory or not, in any faunal district, is a serious loss to science."

(8) *Forest reproduction and watershed protection.* Grazing and browsing animals, especially deer, but also other members of the deer family, rabbits, and rodents, are capable of seriously suppressing forest reproduction and of endangering the water-holding capacities of watersheds when the range becomes overpopulated. These have been two of the most insidious economic repercussions where big game herds have been permitted to increase beyond the optimum carrying capacity of the natural forage supply. In Pennsylvania, the tremendous deer herd at its peak was probably destroying more timber of potential commercial value in a year than forest fires. In California and other mountainous states, serious permanent damage to watersheds has been caused by superabundant grazing and browsing animals.

Palmer (1898) presents a poignant lesson in the dire destruction which can result from overbrowsing: "The historic island of St. Helena was, at the time of its discovery, covered by a dense forest. More recently it has been described as a comparatively barren, rocky desert, because of its devastation by goats (introduced by the Portuguese) which, within 73 years, increased to thousands. They browsed off the protective cover of vegetation, exposing the soil of the steep slopes to erosion, and soon bare rock replaced the wooded hills."

It is not inconceivable that a similar fate awaits large areas of the United States if herbivorous animal

are not held in check in some manner. Where a population of this kind is not harvested adequately as a game crop for hunter's recreation, natural predation should be encouraged to aid in control of such populations. This can be one of the most valuable contributions of predatory animals to man's economy.

(9) *Control does not necessarily increase game populations.* The title of this portion of the report is probably misleading, because, so far as the writer knows, no one has ever defined "control" in terms of predation. Does control mean complete extirpation of all predatory animals, or only certain species, or of only individuals of certain species? Or does control mean a satisfactory reduction of number of all species, of certain species, or of individuals of all or certain species? And is "satisfactory reduction" accomplished by removing 10 per cent, 30 per cent, 50 per cent, or 90 per cent of the entire predator population, or should 60 per cent of one species and 20 per cent of another be removed?

From this it can be seen that when some investigator reports that "predator control did not cause an increase in game populations," it means next to nothing. In the first place, has anyone ever demonstrated the ability to *control* effectively all predatory species over an extensive area? They reduce the predator population, quite effectively for some species, but others, often the most destructive, escape almost untouched. Edminster (1939) attempted to control predators on a tract in New York, but after removing one carnivore for each four acres of the study area reported: "Records of predators taken the second year indicate that elimination was markedly successful on the long-eared owl, red-tailed hawk, and small brown weasel; moderately successful on the horned owl, marsh hawk, and crow. Species that showed little or no reduction the second year included

the Cooper's hawk, sharp-shinned hawk, sparrow hawk, red fox, gray fox, skunk, domestic cat, red squirrel, and raccoon."

Other investigators, even with much expert assistance, have encountered similar difficulties in attempting to control predator populations on large tracts. There is a constant influx from surrounding areas, and those which escape capture are often the older, wiser individuals which are probably the most capable game destroyers. *Complete control apparently can only be accomplished on small areas where specially-constructed pens exclude all predators, whether avian or terrestrial.*

The important thing to consider where studies have indicated that predator control has not increased game populations is: *has there actually been control? A substantial reduction of predators does not necessarily mean reduced predator pressure!* In the work of Edminster cited above, the almost complete elimination of long-eared owls, red-tailed hawks, and small brown weasels may have had little or no direct effect upon nesting success or chick survival of ruffed grouse, but indirectly, because all three are known to kill large numbers of small rodents, they may have actually contributed to nesting success had they been permitted to live (red squirrels commonly steal eggs from grouse nests—King, 1937). Stoddard (1931) found that a reduction of marsh hawks, which were presumed to be natural enemies of bobwhites, resulted in an increase of cotton rats which were collectively of much greater importance as quail predators (eggs) than the marsh hawks. Thus, the continued presence of marsh hawks, in spite of limited predation, contributed to the prosperity of the bobwhite.

Even among predators which are known to prey directly upon the eggs, young, or adults of any species, sub-

stantial reduction does not necessarily mean reduced predator pressure. It is thought that a certain percentage of a prey population is vulnerable to predation because it occupies precarious portion of the habitat, and it is believed that this percentage can just as effectively be eliminated by a reasonable number of potent predators as it can by twice that number. In other words, *moderate reduction of predators may have little or no effect upon the ultimate prosperity of a prey species.* Errington (1936) found: "Contrary to what would seem most reasonable at first glance, lower population of the most formidable predatory types, down to scarcity or actual absence on the observational areas, has *not* resulted in any appreciable lessening of the net pressure of predation upon bobwhite winter populations."

A concrete example showing that predator reduction does not necessarily cause a decrease of predator pressure is given by Lehmann and Fuller (1943). In 1942 on a study area of 960 acres (Texas) with a quail population of one bird per 2.52 acres, only about 5 nests out of every 100 were succeeding. Among 50 nests finally located, coyotes destroyed 26 (52%) and accounted for 274 eggs out of 559 (49%). Fall trapping and accurate age determination of more than 2,600 quail showed a ratio of 2.2 young to each adult. The ratio of young to adults, according to the authors, would have been approximately five to one except for heavy nest losses, presumably by coyote.

Then in 1943 in their own words: "Approximately 762 quail, 1 bird to about 1.2 acres, began nesting on the 960 acre study area on the Jones Ranch in late March, 1943. From May 11 through June 1, 50 active quail nests were found in or near this area. The clutches were large containing from 8 to 24 and averaging 14.8 eggs each. The weather was

favorable; nesting cover was luxuriant. State predatory animal trappers had taken 632 coyotes and 35 bobcats from the Jones Ranch and surrounding ranches the previous winter, and the animals were definitely not abundant. In other words, prospects for a bumper quail crop were excellent. These prospects were soon to be dimmed, however, by those coyotes which did remain.

"By June 15, in fact, coyotes had destroyed 28 of 50 study nests, or 56 per cent. They definitely killed 5 adult quail on the nest and probably killed 2 others. Six nests (12%) were terminated by skunks; one is still incubating. Only 15 nests (30%) hatched.

"The impression of nesting success conveyed by the 1943 nesting studies (30% hatch) is overly optimistic. Forty-eight of the 50 study nests were incubating when found. Since egg loss is always heavier when quail are laying than it is when they are setting, it is apparent that the over-all loss of quail eggs was more than 2 nests in every 3. Actually, only about 10 per cent of the adult quail, rather than 30 per cent, now have young."

For studies designed to measure the value of predator control as a management practice for increasing game populations, it is recommended that control be selective and intense and that, if game populations do not respond to this control, hasty conclusions should not be accepted until it is definitely known that predator pressure had been alleviated.

Even though the above discussion would seem to be intended to refute the statement that "predator control does not necessarily increase game populations," there are many instances wherein predators are not the controlling factor in game populations and, therefore, predator reduction can have little or no value. During the decline of ruffed grouse, snowshoe hares, and other cyclic species, predator control appears to offer

little assistance in preventing the crash. Where food, or water, or other "necessities" are lacking, predator reduction cannot prevent a prey population from falling to the level set by a more restrictive controlling factor. And in the words of Hamilton (1937): "We have seen that wholesale destruction of predatory species does not often accomplish the anticipated end result of favoring game increase. The disturbance of Nature's equilibrium sets in operation a host of unlooked-for consequences. Each animal in an ecological complex is closely related to its neighbors, the whole making up an elastic web which, if but slightly disturbed, makes for great, and frequently grave, consequences."

(10) *Predators remove only surplus game over the "carrying capacity" of the habitat.* A theory has been advanced which states that only that proportion of a prey population which occurs in excess of the carrying capacity, or threshold of security, of the range is subject to heavy predation.

What establishes the threshold of security for a particular habitat? Food, cover, and intolerance to crowding have been suggested as prime factors, but to what extent do these limit or alter the capacity of the environment? For example, in the northern states there is ordinarily an abundance of food for bobwhite quail except during the winter and early spring months. Thus, carrying capacity as governed by food is seasonal in nature, and ordinarily becomes a true limiting factor only during three or four months of each year for this species. If the winter is open, the potential is perhaps two, three, or more times higher than it is when the ground is covered with deep snow for long periods of time. It is known that a single severe winter, or at most two consecutive severe winters, will nearly annihilate bobwhite quail in northern states,

and that even over ordinary winters there may be a substantial loss ascribable to climatic factors, or to the sparsity of food and cover caused by them (deep snow).

Food, then, may be an important, although inconstant, factor in the establishment of carrying capacity for bobwhite quail in northern states, but what is the role of food on the southern quail range where losses of adult birds from severe weather, i.e. deep snows and extreme cold, and temporary acute shortage of food are practically unknown? How does the food supply affect prey species living in the North which are relatively immune to climatic forces in the adult stage? The numbers of varying hares, for instance, during the period of cyclic increase are little affected by the food supply until they have reached a near-maximum population. Except during periods of unusual abundance, the food supply appears to have little effect upon the survival of snowshoe hares and other hardy northern animals and probably is not the prime factor in the determination of carry capacity.

What about cover? For most game species, cover is of primary value as protection against predators. For this reason, carrying capacity as established by the amount and distribution of protective cover is almost identical to that resulting from the effects of predation since the severity of reduction by predation is nearly proportional to the quantity and quality of escape cover. Cover can hardly be considered as an important factor governing the carrying capacity of a habitat, because, unless predators are present, it probably has only a minor influence upon the numbers of most game species.

Intolerance to crowding is unquestionably a limiting factor for many animal populations when at a very high level, but it is unlikely that it is important at lower levels. With the present heavy gun pressure, it is

doubtful whether overcrowding is a limiting factor for many game species on most areas in the United States.

If carrying capacity as fixed by the *food supply* varies widely according to climatic conditions, and if *cover* and *intolerance to crowding* are excluded as modifying influences, it would appear that perhaps predation itself is a major factor in the determination of the carrying capacity of land. During winters marked by heavy snows when a shortage of food and the resulting malnutrition may cause a large part of the quail population to become weakened physically and less alert to dangers, is it not probable that many of these subnormal birds, which because of their weakness become more vulnerable to predation, might have survived if predatory pressures had been lighter or non-existent? In this case, which factor exercises the greater degree of control, or, to put it differently, which depresses the quail population to the greater extent? If there were sufficient food to permit the survival of 1,000 bobwhites on an area of land in spite of deep snows, but predators reduce this figure to 600 by removing a portion of the weakened individuals, which is more to blame for the winter loss—the lack of food or predation?

The final conclusion is that the food supply, the vegetative cover, and the intolerance to crowding will all permit the survival of a larger number of game animals when predators are not present than when they are present, and that predation almost invariably magnifies the depressive action of any of the other factors causing a reduction of carrying capacity. To state that predators remove only those animals living in excess of the carrying capacity, which has perhaps already been set by predation in many instances, appears illogical.

(11) *Other game management practices may partially alleviate predation.*

No lengthy discussion or detailed account of the "dampening" effect of good cover upon predation is needed. Wildlife biologists are generally agreed that, without adequate cover, prey populations are susceptible to heavy predation, but when sufficient protection is available losses are likely to be comparatively light. Thus, the provision of the proper kinds of vegetative growth is an important means of combating the effects of predation.

Emlen and Glading (1945) say: "Habitat improvement is the offensive arm of a management program capable of making new and permanent increases in the breeding stock; protection is a defensive activity, a fight to reduce the normal pressure constantly exerted on a population by its many enemies. . . ."

It should not be inferred that merely the provision of an additional amount of protective vegetation will invariably result in a decrease of predation or an increase of game. This new cover must be of the proper kind and must be established in the proper places. Heavy cover is of little value if vulnerable prey species must leave it and expose themselves in the open in order to feed. There must be a favorable juxtaposition of food, roosting sites, and nesting sites in relation to the existing protective cover for game species to profit by this management effort.

Habitat improvement may be accomplished in several ways: planting, plowing, cutting, burning, liming, fertilizing, reduction or increase of grazing, and others, but it is beyond the scope of this study to analyze the merits of each in respect to its value in alleviating predation.

When game animals are not properly nourished, their normal vigor and alertness are likely to be diminished and they may become easier for predators to catch. Any management measures which would

insure adequate nutrition for game, especially during the winter months, might measurably reduce the predatory loss. This result may be achieved by permanent plantings, by annual food patches, or by emergency winter feeding.

Other more specific measures may be of benefit. Stoddard (1931) found that the burning of broomsedge fields exposed cotton rats to hawks and owls and thus reduced quail egg destruction by these rodents. Controlled harvests of game during hunting seasons may remove surplus populations which would be lost to predators over the winter.

These are just a few of the ways by which the mortality from predation can be prevented or alleviated by management measures other than direct predator reduction.

(12) *Predators an important factor in the survival of certain prey species.* It seems completely contrary to common knowledge (and certainly to common belief) that predators could be necessary to the survival or well-being of certain prey species, but it appears to be a fact. Even excluding the more obvious relationship, which has already been discussed concerning the role predators play in preventing herbivorous animals from exceeding their food supply, there are other important ways in which predators contribute to the prosperity of prey species.

First, it might be well to review briefly the benefits of predation upon prey populations which have a tendency to increase beyond the limits of their food supply. The reproductive potential of most organisms is tremendous when measured in terms of months or years. Cole (1948) says: "Some of the common fallacies about populations may be resolved by simply remembering that any population must be finite in size. The reproductive potentialities of all organisms are such that, if unimpeded, populations would grow in a manner

very like a sum of money placed at compound interest. It has been estimated by Hodge that one pair of houseflies reproducing at their maximum rate could in five months produce enough descendants to cover the earth to a depth of 47 feet. By a slight extension of the computation it may be shown that under the postulated conditions about one year would suffice to make the number of houseflies equal to the number of electrons estimated by astronomers to be present in the visible universe. This is a dramatic but not an extreme case, as many organisms exceed houseflies in reproductive potential."

This potentiality for increase is by no means confined to insects and other smaller animal life. Darrow (1947) states that it is possible for one pair of grouse to produce a population of over 33,000 individuals in only six years, and Grange (1949) extends this expansion of numbers to 2,000,000,000 in eleven years. The possibilities for cottontails, meadow mice, and other fecund species would be even more startling.

From these arithmetical illustrations of the reproductive potential of animals, it can be seen that, if sufficient counteractive forces, of which predation is one, are not constantly at work, the earth would be almost immediately overrun by hordes of animals, the vegetation completely denuded, and perhaps when the devastation had been completed the only surviving life would be microscopic one-celled plants and animals. Predation, then, except perhaps when it conflicts directly with man's interests, should be accepted as a normal and desirable biological function necessary for the continued existence of life on this planet.

In the words of Huxley (quoted from Elton, 1927): "I suppose that most professional biologists think of the relation of carnivores to herbivores, preyer to preyed-upon, al-

most wholly in the light of the familiar metaphor of *enemies*; and of the relation between the two as being in some real way like a battle. The ecologist, however, speedily arrives at the idea of an optimum density of numbers, which is the most advantageous for the animal species to possess. He then goes on to see by what means the actual density of population is regulated towards the optimum; and finds that in the great majority of cases the existence of enemies is a biological necessity to the species. . . . to have the right enemies,' though it can hardly be spoken of as an adaptation, is at least seen to be a biological advantage."

Although the theoretical reproductive potentialities of any animal are never fully realized, except perhaps very temporarily, the fact that "irruptions" and "plagues" do occur indicates that certain animals may at times momentarily escape from the forces controlling it. This brings us to a more practical discussion of the role of the predator in the survival of prey animals. When a prey species escapes from the control of its natural enemies and exceeds the carrying capacity of its range in respect to the food supply, these animals must die in large numbers or emigrate to other regions, often with disastrous results. In either case the reduction may be so severe as to place the species precariously near extermination. Predation may seriously reduce populations, but seldom to the low point reached by animals on "eaten out" ranges. The Kaibab deer herd and the present herds in Pennsylvania, Michigan, New York, Wisconsin, and other states illustrate instances of a game animal escaping from its predators. The starvation losses suffered by these herds is well known.

Another example, not exactly similar but related to the food supply nevertheless, is given by Leopold

(1933): ". . . a normally distributed herd of deer on Vancouver Island, after the lions and wolves had been killed off for their benefit, suddenly 'huddled up' on a small part of their original range and overgrazed it. Apparently normal predation had some as yet obscure influence in keeping the deer normally distributed over the range."

Cartwright (1944) outlines another way in which predators contribute to the survival of their prey: "This brings us to the role of the predator. It is obvious that a species with a 3-year life span which produced all its young uniformly in June would become extinct if three successive adverse seasons destroyed the hatch. Hence, predation, by destroying a substantial proportion of the first and second nestings, *staggers the nesting attempts and thus becomes a major factor in the survival of the species*. To be effective, the predation must be substantial, probably not less than 50 per cent of first clutches."

Cyclic species, especially those whose "crash" is brought on by disease or parasitism, may be materially benefited by predation. Elton (1933) describes an instance of this: (from Hamilton, 1939) "In Norway the willow grouse in earlier years used to multiply periodically and every three or four years every sportsman got a fine bag. After these good years the grouse, as they do in America, died off from disease because they had become so populous. At the same time, the Norwegians had a great drive to wipe out birds and animals of prey, eagles, foxes, martens, and other fur animals. As the birds and predatory mammals have become scarcer, it has been noticed that the epidemics among willow grouse have become increasingly worse. Instead of more and better willow-grouse populations having been produced by supposed protection through widespread destruction of predators, the stock of

these birds has become progressively more decreased.

"It was suggested that the reason for this great mortality was this: when a grouse became sick with coccidiosis, it weakened and flew less readily and was thus easier to catch. As a result, in the old days the predators used to catch the sick birds more readily than the healthy birds and so prevented disease from becoming too severe, except after the birds had become very abundant."

Beside these instances wherein predators may actually be necessary to the survival of the species, they may perform a worthwhile service by contributing to the prosperity of others. The oft-quoted example of Fisher (1908) illustrates this relationship: (from Hamilton, 1939) "An extensive marsh in northern New York harbored great numbers of ducks, rails, turtles, and other aquatic life. The snapping turtles deposited their eggs in great numbers in the sands of an old beach bordering the swamp. These delicacies attracted the skunks of the neighborhood, and their feasts so reduced the total output of eggs that only a small percentage of the young hatched and reached the water. As time went on conditions changed. Skunk fur became fashionable and commanded a good price. Within a short time the skunks almost disappeared. When the check on their increase was removed the snapping turtles hatched in great numbers. When their numbers had been naturally controlled by the destruction of a large proportion of their eggs, their food supply was adequate, but when their numbers greatly increased the supply proved insufficient. Finally, through force of circumstance, the turtles added ducklings to their fare until the few ducks that refused to leave the marsh paid the penalty of their persistence by rarely bringing to maturity more than one or two young. At last there came

about a depreciation in the value of skunk pelts, with a corresponding loss of interest on the part of the trapper, so that the progeny of the surviving skunks congregated at the old beach and devoured the eggs of the turtles which had enjoyed a brief period of prosperity. This, coupled with the destruction of the turtles by market hunters, attracted more ducks and the old marsh again became a populous center for gamebirds."

And the bluejay, which is notorious for its egg-stealing propensities, was found by Lay and Siegler (1937) to be a real asset to bobwhite quail in Texas: "The number of acorns made available to quail by bluejays is so great, that the jay is very likely the most important link between the acorn and the quail in woodland type as exemplified by Walker County, Texas."

Hamilton (1937) gives still another example: "We yet know little regarding the relations existing between the mouse millions and game birds. What has been recorded indicates that the food of the little deer mouse is similar to that of the grouse. One mouse will store a peck of beechnuts or several quarts of clover seeds. Various small mammals, which frequently number more than one hundred to the acre, are potentially very important competitors of game birds for the available food supply. Fortunately their numbers seldom get out of bounds, for alert foxes, weasels and other predators are always ready to grab them up."

And still another example of indirect benefit of predator to prey: It is said that on some English heaths, an overabundance of rabbits causes the heather to be replaced by grasses or bracken, both of which are of little value as food or cover for Scotch grouse. Thus, a reduced rabbit population as may be maintained by reasonable numbers of predators might contribute to an increased Scotch grouse population.

## Arguments Favoring Predator Control

### (1) Livestock and poultry damage.

It is useless to cite a large number of examples of recorded economic loss from predation, because the fact is accepted, and well known, that predators do cause a monetary loss to farmers, ranchers, and poultrymen running into several millions of dollars annually. The literature is full of these figures. For instance, Goldman (1930) states: "In 1915 and 1916 the losses of livestock from rabid coyotes in Nevada alone were estimated at \$500,000. Four hundred head of cattle were reported to have been killed on one ranch." And later he adds: ". . . National Forests, where 100,000 head of sheep were killed by predatory animals last year (1929) according to figures compiled by forest officers, . . ." Latham (1943) says; "The annual poultry loss from fox predation in Chester County (Pennsylvania) alone is conservatively estimated to exceed \$20,000 and proportionate damage is suffered in each of the other counties of the study area." Whether on the sheep and cattle ranges of the West or on the poultry "ranges" of the East, predation takes a constant toll of the flocks and herds.

Protectionists advocate preventive measures instead of predator control to alleviate this loss and there is much merit to many of their suggestions, but it is not economically practical, nor possible in many cases, to exclude predators with wire fencing, frightening devices, more herdsmen, or other expensive measures.

Gabrielson (1941) capably summarizes the problem of predation on livestock in this way: "The practical side of this matter is that there is a definite loss to the livestock industry, usually felt most severely by the small operator, and that this loss is direct and visible and very frequently a serious matter to the individual

concerned. It is inevitable that some sort of human control will be exerted, but a compromise between extremists as to the proper degree and scope is difficult to arrange. Sane handling of the problem obviously lies somewhere between the total extermination desired by the outraged stockman and the no-control idea of the detached nature lover.

"It is always to be kept in mind that the destructive effect of the predation here discussed is not so much upon the total population of domestic animals as upon the economic welfare of human beings dependent upon these populations. For example, coyote activities might never completely destroy or even greatly reduce any certain band of sheep or flock of turkeys, and yet they might seriously affect the livelihood of the families dependent upon them. The margin of profit, which must furnish that livelihood, is usually small and a very modest loss may wipe that out.

"In such circumstances, the problem becomes not one merely of animal interrelationships but of economics and human economic welfare as well. So long as it is necessary for man to tend his flocks in regions seriously infested by predators, some form of control will be exercised. Theorizing as to natural balance of animal populations in the world will not change the fact. The only questions are, how much control is necessary and how shall it be undertaken? On both these questions there is much room for argument. A fair examination of this phase of the wildlife problem makes it obvious that control is necessary in some areas and that in others no control is justified. There is also a borderline zone between the two where differences of opinion will always occur between the advocates of drastic con-

trol and those believing in little or no control."

(2) *Increased game populations for recreational purposes.* Since most of the so-called "protectionists" or "nature lovers" and even some of the professional biologists still insist that "in no instance has it been shown that predator control has caused an increase in game populations," several actual examples of increase, picked at random, will be presented.

Goldman (1925) speaking generally says: "The disastrous effect of predatory mammals on game has been clearly demonstrated, but not always fully realized. In various parts of the West, where through systematic efforts the predatory mammals have

been greatly reduced in numbers, there has followed a marked increase in deer, wild turkeys, sage hens, quail, and other game species. . . ."

Speaking more specifically of coyote-deer relationships in California, Horn (1941) states: "After coyote removal, there was an increase in fawn survival each year. In brief, this study shows that coyotes on this area feed largely upon deer, and that the removal of the coyote has resulted in increased survival of fawns with an increase in the younger age classes of deer."

A recent Outdoor News Bulletin (1949) carried the following release: "Antelope fawn survival has been found by the U. S. Fish and Wildlife



PGC Photo

*When a game animal no longer has any important natural enemies to remove the surplus, it may increase to such an extent that it "eats out its range" and the surplus is lost through starvation. This is the history of the white-tailed deer in many states.*

Service to be directly proportional to the extent and effectiveness of coyote control in several states, . . .

"On Arizona ranges where scientific methods of control has been employed, a fawn survival rate of 94 per cent was recorded; where no control was used, survival was as low as 21 per cent. In Alaska, the Service's stepped-up control program already has been reflected in increases in moose, caribou, deer, mountain sheep, and reindeer. Stockmen also have benefited. Albert M. Day, director of the Fish and Wildlife Service recently stated, 'In many parts of the West, from New Mexico to Montana, where losses formerly ran as high as 15 per cent, sheep are now being ranged without herders and without losses from predators.' Control of stock-killing coyotes in many areas is saving farmers and ranchers millions of dollars."

Gabrielson (1941) adds more information on antelope: "An outstanding example of the effect of predator control occurred with the upswing of the antelope herd in the territory adjoining the common boundary point of Nevada, Oregon, and California. In that region a small herd remained in 1920 and 1921, when the species had reached

its lowest ebb there. The antelope were protected by state game laws, and there is little evidence that any considerable number were killed illegally. After their low point in 1920, when the animals had decreased noticeably from disease and possibly other causes, predator control operations were undertaken by the Biological Survey, and between January 1, 1921, and June 30, 1934, a total of 7,595 coyotes and bobcats were removed. While the reduction of the predator population was being carried on, the antelope herds, which had for several years been stationary, with comparatively little success in rearing fawns, gradually increased from about 500 animals to their present population of 7,000 to 8,000. Now the antelope are numerous enough for the same or even greater predator pressure to be of less importance than formerly, and other factors affecting the herd may become more serious."

Another example of big game response to predator control is given by Hamilton (1939): "Formerly a policy of exterminating all predators over a 40-year period so favored the deer, bighorn, and mountain goats that these animals had by 1920 become a serious nuisance and even a

*In the South, it was found that marsh hawks actually benefited bobwhite quail by catching the cotton rats which destroyed their nests.*

PGC Photo by Brown



threat to human life. After hundreds of bighorn had been trapped and shipped to restock depleted areas in the United States and Canada, the menace of overpopulation continued. The sheep actually stood on roadside embankments and, as motorists drew level with them, attempted to leap over the cars. These leaps often fell short, with attendant damage to people and cars. Rocky Mountain goats became so numerous that they encroached and took possession of the upper bighorn ranges, driving the sheep to lower valley levels. Deer ran amuck in the city of Banff, destroying gardens and lawns and creating a general disturbance. In an effort to reduce this excess dangerous population of deer and other big game animals, wardens were instructed to cease killing predatory mammals. Little change was noted for three years, then a perceptible decrease was observed in large game. With an increase in their population due to protection, mountain lions once more became numerous and upon occasion actually entered the city of Banff, where they killed deer and sheep. By 1930 the cougars had so routed the game herds that Banffites were alarmed and predatory-animal control again came into force. With the killing of a number of cougars, the herds have reinvaded the city and undoubtedly will again become a problem if predator control is carried to extremes."

The benefit of predator control to game animals is not confined to larger species alone. Stoddard (1931) was one of the first to demonstrate that selective predator control would increase small game populations (bobwhite quail). His conclusions are: "Perusal of the chapter devoted to 'quail mortality' should convince the most skeptical that natural enemies of the bobwhite must be controlled under certain conditions, if any considerable surplus of birds

is to be available for sporting purposes year after year."

Similar results were recorded by Glading, Selleck, and Ross (1945) with valley quail in California: "It is our belief that the intensive local predator control such as was practiced in the years up to 1941 was largely responsible for the high population of quail. This is borne out in part by the fact that in 1942, when predator control was comparatively lax due to the loss of manpower and the illness of the remaining employee, the population slumped badly, even though feeding was continued at roughly the same rate. Unpublished studies of the Cholame Experimental Area (Glading and Ross, ms.) reveal that such intensive local predator control can result in considerable increase in quail. . . ."

Stoddard and Komarek (1941) express the undesirability of excessive predation by saying: "In the Southeast the bobwhite is, for all practical purposes, single-brooded and, while these birds continue nesting attempts from late April to August or September if necessary, they cannot perpetuate and furnish a shootable annual surplus where combined pressure from natural enemies is too great during the breeding season—even though food and cover conditions approach the ideal."

Increases in wild turkey numbers as a result of predator control in Georgia are reported by Riter (1941): "E. A. Schilling, Range Examiner, Southern Region, United States Forest Service, recently reported an interesting observation made on an area comprising some 100,000 acres on the Chattahoochee National Forest in northern Georgia. Much cultural work had been done on the area to provide openings in the forest canopy and artificial food patches for game. The remnants of wild turkeys and grouse that were being fostered were not responding

to the improvements and the protection afforded. Something was wrong. Investigations revealed that bobcats and foxes were numerous; wild turkey bones were frequently noted at bobcat dens; and evidence of turkey and grouse kills by foxes was found. Several bobcats and foxes were trapped and their stomach contents analyzed. The analyses disclosed that grouse and turkey constituted an important part of the diet, thus substantiating field observations. In 1937, after careful preliminary study, a general trapping program was initiated on the area. In order that trapping of the furs should not be wasteful, the season was limited to winter months. During 1937, 126 bobcats and 116 gray foxes were taken, and in 1938, 91 bobcats and 83 foxes. A great increase in the turkey population was noted in the fall of 1937. An additional increase was noted in 1938, but the gain was not so great as it had been in 1937. All factors considered—climate, food, cover, protection from shooting—it

was evident that the sudden increase in the number of turkeys was in response to protection afforded against predators. Mr. Schilling also reported a similar result on a 125,000-acre area on the Black Warrior National Forest in Alabama."

And Edminster (1939) found that predator control permitted a 25 per cent increase in the numbers of ruffed grouse in New York when the population was below the carrying capacity of the range, but that predator control appeared to have little effect upon the population during peak years. He suggests, however, that if the study area had not been closed to hunting, and the grouse population had been prevented from reaching a peak, the predator control efforts may have continued to be fruitful.

It has been shown that, in some instances at least, predator control has caused an increase in game populations. There are other studies which show, just as conclusively, that predator control did not favor game in-



PGC Photo by Latham

*Poultry is sometimes wantonly destroyed by individual predators, but this is often the result of neglect on the part of the farmer.*

increases. Why should the same management practice be effective in one case and not in another? If it is definitely known that predators are killing individuals of a game species or destroying the eggs and predator control does not initiate expected increases in the population, there are two possible explanations for this apparent discrepancy: (1) that predation is not the factor effecting ultimate control of the population, or (2) that control has not been complete enough to reduce noticeably the degree of predator pressure.

Ordinarily predatory species are larger and are slower breeders than the species which form their prey. Thus, if a prey population is large, it is difficult for the predator to breed rapidly enough, providing it also is subject to certain population checks, to kill more than a surplus quantity of the prey annually. However, even though this surplus lost to predators may not be important to the continued existence of the species, it may be that portion of the population which man wants to harvest as game or, in the case of poultry or other livestock, to sell for profit. Where a large prey animal is harassed by a smaller predator with a greater reproductive potential, the degree of control may extend well beyond the surplus as was seen in the coyote-antelope-deer relationships described above. Gabrielson (1941) says in regard to this: "The coyote is a much more prolific breeder than these two big-game species and when their pressure is concentrated on the slower breeding forms during the fawning season it may have a definite effect on game abundance, even though there is no predation during the rest of the year. When the herbivorous population is high and predators are in normal numbers, predator pressure is obscured, and, to say the least, its measurement is difficult. Under such conditions predation may well become a negligible factor, and the

predators, even though preying to a normal extent on deer or antelope, may still be utilizing animals that are surplus to the existence or even the welfare of the herd."

From the above discussion, it would appear that, if big-game populations are decreased below a certain level, predator reduction may effect a comeback to more normal numbers unless a more potent controlling factor is holding the game in check. On small game, the effect of predation is likely to be less noticeable because of the greater fecundity, but even here it is sometimes possible to increase the shootable surplus for recreational purposes by means of selective predator control, although this is not often a practical venture.

That predator control to increase game populations is a permissible and acceptable management measure is attested to by Stoddard (1931): ". . . Control of competing forms of life is, however, as legitimate and necessary upon lands devoted primarily to game production as upon those devoted wholly to agriculture. . . ." And Gabrielson (1941) adds to this: "Where game birds or mammals are subjected to severe hunting, the addition of the hunting pressure to other adverse factors may quickly reduce the normal population of game. In such areas predators may be a factor of importance, and their reduction may be necessary to a greater production of game."

(3) *Protection to near-extinct prey species.* Since all agree that any species permanently removed from the native fauna is an irreparable loss to science and to mankind in general, it is conceded by most that rigid protection of the isolated remnants of an endangered species is highly desirable. The trumpeter swan is one of these species threatened with extinction. Riter (1941) concludes: "The Red Rocks Lake Refuge in Montana, for instance, supports a large part of the only nesting population of the trum-

peter swan left in the United States. The number of these birds is so very small that it is still doubtful whether the species can be restored. Certainly predation may easily be disastrous and there should be no question as to the advisability of control if predation should occur to any degree whatsoever."

The writer also believes that *just as rigid and sincere protection should be provided for endangered predatory species.*

(4) *Destruction of newly released, artificially propagated game.* This subject should be thought-provoking; for, although the hand-reared game which is quickly killed by predators following release may have cost the sportsmen of the country millions of dollars, there are many wildlife biologists who sincerely believe that predators are performing a valuable service in doing this. These biologists are of the opinion that artificially reared game which is stocked to supplement native wild game may, in the long run, cause a decrease in these wild populations and, consequently, in the numbers available to hunters for recreation. By carrying disease, by hybridizing with the wild stock and perhaps thus reducing the vigor, hardiness, or wildness of the race, by attracting predators, and by other possible known and unknown effects, propagated game is sometimes believed to be of primary importance in the failure of game crops.

But regardless of whether this predation is a service or a disservice, it is believed that *predators probably kill at least 50 per cent of all artificially reared small game released in the United States, and the loss is almost certainly even greater than this.* The writer and others who have had occasion to release pen-reared game have had the experience of seeing a hawk (usually a Cooper's) strike and kill a bobwhite quail, Hungarian partridge, or ringnecked pheasant on

its initial flight from the crate. Latham and Studholme (1947) estimated that 70 per cent of 1,000 experimental bobwhites released on a study area in southern Pennsylvania had died or had been killed by predators within the first month after release. Of one release of ten birds, a farm cat deposited nine of the ten (bands and all) on the back porch of the farmhouse within a few days.

English (1934) found 3 newly released Hungarian partridges, from a release of 56, with bands on their legs at a red-tailed hawk nest under observation in Michigan, and Wingard (1949) found the remains of 6 recently stocked ringnecked pheasants at the nest of a horned owl in Pennsylvania. There are many other similar records in the literature.

Pough (1948) sums up the effect of predators upon artificially reared game and the possible indirect influence upon wild game as follows: "The high percentage of stocked birds that vanish a short time after their release suggests that such birds must be excessively vulnerable to predators and recent studies seem to bear this out. Tubbs (1946) reporting on a series of releases in Michigan showed that while 9 per cent of the pheasants released 1 month before the hunting season were later bagged by hunters, the number that survived to eventually be shot fell off very rapidly. Only 6.3 per cent of the birds out 2 months were bagged, 5.3 per cent of the 4-month birds, 4 per cent of the 6-month birds, and only 1.1 per cent or barely more than 1 in 100 of those that had had to survive for 11 months in the wild. If the matter stopped there we could be fairly philosophical about it and simply assume that in any release there was going to be a lot of tame and under par birds that were bound to be weeded out by one method or another. Unfortunately, the matter does not stop here, as there is an increasing amount of evidence to in-

licate that predators as individuals do not always take those animals that are at the moment most abundant and therefore easiest to obtain. On the contrary, it appears that once a predator has learned how to catch and become used to taking a certain type of prey, it will continue to seek it. To turn loose tame, inexperienced game-farm-reared birds that have never had any parental training in avoiding predators, just as the season's crop of young predators are learning to fend for themselves and are acquiring feeding habits that will influence their choice of food for the rest of their lives, is to ask for trouble. Twenty-seven of a spring release of 98 pheasants in Michigan were found within a month at a fox den or at feeding logs (Anon, 1948). By the time the supply of these easily caught game-farm birds is gone many of these predators will have learned how best to catch a game bird and may have become confirmed in their habit of preying upon them. As a result they are likely to make an extra effort to catch some of the local stock of wild birds in order to continue what has become a well-established feeding habit."

(5) *Harassing effect.* Leopold (1933) summarizes this phenomenon which has been observed and recorded by many investigators including Errington (1936), Stoddard (1931), Latham and Studholme (1947), and others. Leopold says: "One adverse effect of predators apparently not heretofore recognized as important, occurs when predators prevent game from feeding, or otherwise interrupt its normal routine, by confining it to 'escape coverts' or other safe but often foodless places. Even though no actual mortality be suffered, such harassment may have serious indirect effects, especially during critical seasons. Thus during the short days of northern winter when food is scarce, and continuous search for food necessary to keep 'body and soul' together,

the confinement of a covey of quail by a hawk for hours at a time may effectively start that cumulative deficit of input over output which constitutes starvation.

"As already mentioned, Errington found that after harassment by a Cooper's hawk, a quail covey may entirely change its previous feeding place, and remain confined to dense 'escape coverts,' not only during the hawk's visit, but for a week afterward. If there be no food within such coverts, the covey must either starve and freeze, or venture forth and be progressively picked off.

"*The Game Survey* (pp. 73-74) found that during the hard winter of 1929-30, most of the quail coveys visited in Missouri were being harassed by hawks, including species probably incapable of catching any but weakened birds. The frequency of evidences of killing by hawks appeared to be inverse to the sufficiency of escape cover (usually osage) at the covey headquarters, and to the food therein (natural, or artificially supplied). The tracks showed the daily cruising radius of each harassed covey to be surprisingly short (often under 50 yards), and usually co-extensive with the escape coverts. All of the visible evidence pointed to the conclusion that harassment of foodless coveys led to their subsequent starvation, or decimation by hawks of some kind, whereas harassment of fed coveys did no visible harm. . . .

"Harassment is not confined to game birds and raptors. I have seen coyotes calmly attending does with fawn, evidently watching for one moment of relaxed vigilance on the part of the mother. It is obvious that the doe cannot feed herself or nurse her offspring in a normal manner while thus attended. . . ."

(6) *Predators as carriers of disease.* One of the most destructive and dangerous diseases spread by predatory animals, especially the *Canidae*, is *rabies*. In an account of an early

outbreak of rabies in the West, Goldman (1930) emphasizes the seriousness of this disease: "In recent years coyotes have been a very serious menace to the human population, as well as to livestock through the alarming spread of rabies, transmitted through them, over several western states. The malady began in central California in 1909, and by 1915 had extended over northern California and much of Oregon, Washington, Idaho, and Nevada. The recorded number of people bitten by November 30, 1923, is over 2,000, of which number 56 died. The prompt application of the Pasteur treatment doubtless saved hundreds of lives. In 1915 and 1916 the losses of livestock from rabid coyotes in Nevada alone were estimated at \$500,000. Four hundred head of cattle were reported to have been killed on one ranch. In January, 1922, a new outbreak in Washington was stopped by the concentrated cooperative efforts of Federal, State, and County officials, when 1,800 coyotes had been killed in four counties. In 1923 the disease was suppressed in parts of California, Oregon, Nevada, Utah, Idaho, and Washington, and in the same year it appeared in coyotes and bobcats in Colorado, where, within a short time, four persons were bitten, and livestock valued at \$4,000 was destroyed. This has been followed by outbreaks

in eastern Washington, eastern Oregon, central Oregon, northern Utah, and sporadic cases at widely separated points in Nevada. Experience has indicated that new outbreaks of rabies may be expected from time to time, wherever coyotes become very numerous." These outbreaks still occur periodically in the West.

Within the past ten years the foxes in the East have become rabid over large areas and have menaced dogs, livestock, and humans. A number of people have been bitten, it has been necessary to quarantine dogs in many counties, and livestock losses have been suffered over scattered areas.

*Tularemia* is known to occur in gray foxes and probably affects other predatory animals. This disease when contracted by cottontail rabbits, muskrats, bobwhite quail, ruffed grouse, and other game and valuable fur animals, may cause losses of considerable economic importance, but the role that the predators play in the spread of this disease is imperfectly known.

Another disease which appears to be concurrent with high fox populations in the East is *Sarcoptic Mange*, a skin condition caused by a parasitic mite. Although the greatest mortality is likely to be suffered by the foxes themselves, the possibility of infestation of other furbearers and dogs is ever-present.



PGC Photo by Latham

Rabies and other serious diseases can be spread to livestock and humans by predators. Here is a red fox with sarcoptic mange.

## THE ECONOMICS OF PREDATOR CONTROL

"An ideal control method would be one cheap enough to be economically feasible, specific enough to control the destructive species without killing other forms, and simple enough for anyone to use with as-

surance of success.

"To be economically feasible, the method adopted must cost in time and expense less than the damage that would result if no control were attempted." (Gabrielson, 1941)

### Predator Control Methods

#### "Hands Off" System

This is at least partially a return to the balance of nature concept previously discussed. The proponents of his system of control, if it could be called control when man does not interfere, are willing to allow nature to "take its course" and wait for overpopulations of predators to adjust themselves to lower levels naturally. It is true that most high, or irruptive, populations of predatory birds or mammals have a tendency to drop, often precipitously, of their own accord. This automatic reduction usually comes as a result of a failure of the food supply or because of disease or parasitism.

If it is admitted that predator reductions are likely to occur without man's interference, providing the populations are abnormally high, it would appear to be a practical method for control. But what are the dangers which may accompany natural control?

If the reduction is ultimately brought about by a failure of the food supply, what has happened to the desirable prey populations upon which the predators have been feeding? Can wildlife managers, poultrymen, or stockmen afford to permit this natural course of events? State game commissions or conservation departments are charged with providing a maximum of recreation for hunters and fishermen, and this can only be done when supplies of game

and fish are adequate. Before a superabundant population of potent predators will collapse from a shortage of food (prey animals), it may mean that some game species will be reduced to a mere fraction of their normal numbers. If Pennsylvania had not trapped or shot 95,000 foxes during the two-year period from 1945 to 1947 and had permitted these animals to breed unchecked until a self-initiated "crash" came, what would have been the effect upon the hunting bag of small game by 1948 or 1949 when the fox population could quite conceivably have exceeded one fox to each twenty to thirty acres? In Pennsylvania during the fiscal year 1946-47, there were 6 foxes killed for each quail shot during the regular hunting season; 20 foxes for each wild turkey; a little more than one fox for each ruffed grouse (1945 figure, closed in 1946); one fox for each 4 ringnecks; and one fox for each 30 rabbits.

If the controlling factor is disease or parasitism instead of a failure of the food supply, new dangers threaten. Both coyotes and foxes are subject to epidemics of rabies, apparently when the population exceeds a certain density. Then humans, stock, dogs, and other domestic and wild animals are bitten and die along with the foxes and coyotes. Control by disease is always a questionable device, because the degree of control cannot be regulated and severe reduction, almost to complete extirpation,

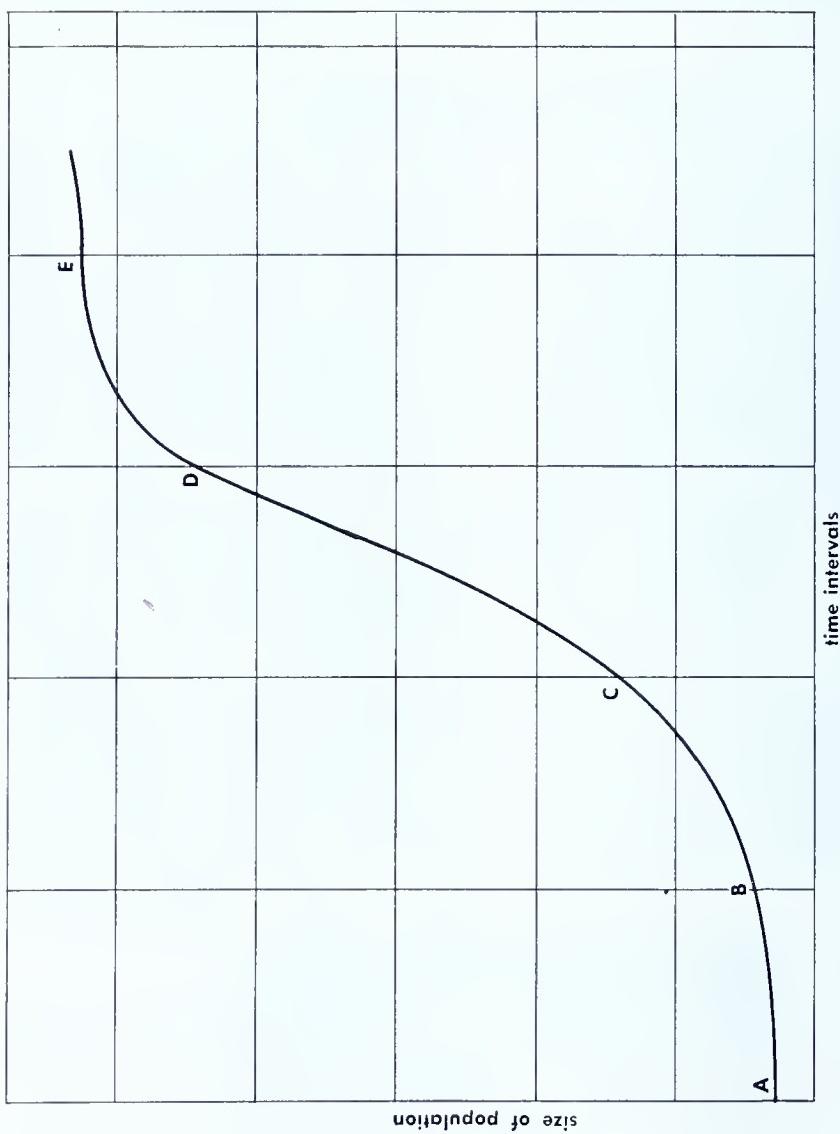


FIGURE 3  
Typical Population Growth Curve.

is possible. Of course, the rancher or the hunter may feel that this would be a highly desirable consequence, but many predators are valued for fur, sport, or other uses and so severe a reduction may not be good management.

### Avoidance and Prevention

Although strictly not a control measure, *avoidance and prevention*, by accomplishing the same end, may be considered as one. Kalmbach and Linduska (1948) defend this approach: ". . . Through the centuries man has had to combat these unwelcome guests [rats and mice]. This he has done by all conceivable measures of reductional control, yet in modern programs of rat control the philosophy of avoidance and prevention as exemplified by sanitation and rat-proofing have become important and integral parts thereof. If, therefore, it is effective procedure and sound economics to attack the commensal rat (for which no one has demonstrated any pronounced compensatory values) through measures of avoidance or prevention, can anyone challenge the legitimacy of a similar approach to troublesome wildlife species, some of which possess outstanding attributes?"

There are many ways in which the ill-effects of predation upon livestock and poultry have been avoided or prevented—wire fencing to enclose poultry, "vermin-proof" poultry houses, high roosts for turkeys on range, coyote-proof fencing on western cattle and sheep range, the use of lights and frightening devices, and other specialized ways. Predation upon wild prey populations, including game, has been reduced by certain habitat management techniques, by regulated wildlife harvests, and by the control of cats and dogs.

### Paid Hunter or Trapper System

Paraphrasing Jacobsen's (1945) objections to the bounty system, it

would appear that the principal advantages of the paid hunter or trapper system are:

(1) It permits concentration against individual livestock and game killers.

(2) It permits work when and where most needed, e. g., in the difficult terrain of summer stock ranges, or to protect valuable game species.

(3) It permits control work at all seasons, and not just during the period of the year when pelts are prime.

(4) It provides a means of meeting emergencies, such as rabies outbreaks, or excessive livestock or game killings concentrated in isolated regions.

(5) It insures continued control efforts beyond the point where bounty or fur trappers would find their hunting or trapping efforts unprofitable.

(6) The trapping of the professionals would likely be less indiscriminate than that of the ordinary private trapper, and thus many desirable animals could be saved.

(7) These trappers could teach farmers, ranchers, and other interested individuals the proper methods of trapping predators.

Jacobsen (1945) champions the paid trapper: "Our own association with the predator problem [in Western U. S.] leads us to conclude that a systematic paid hunter plan will bring more lasting results under normal conditions. Paid hunters can be trained in den hunting, in certain tedious and specialized methods, and in the use of quite selective poisoning processes for areas of high predator population and of the recently developed cyanide injector apparatus."

Jacobsen also favors the hiring of hunters and trappers by groups of farmers and livestock companies as practical in the West as a supplement to bounty and government control.

Among the disadvantages, the following may be listed:

(1) Excessive cost, particularly for smaller predators. Few cost figures could be located for the control of large predators, but Hamilton (1946) says: "State hunters have paid their way in controlling the larger predators. California paid a bounty on mountain lions for many years but finally employed a state lion hunter to keep these big cats from becoming too abundant. All accounts indicate that the state-hunter system is more desirable than the bounty."

On the other hand, Marston (1942) states: "There is always the alternative of paid hunters, but personal experience in hunting cats [bobcats] leads the author to question whether a paid hunter could produce sufficient results under all conditions to warrant a full-time salary."

Douglass and Stebler (1946), in reviewing the practicality of the paid trapper system in Michigan, say: "After the repeal of the bounties in 1921, a system of state warden-hunters was instituted, which lasted until June, 1934. During this period a total of 14,410 predators (bobcats, coyotes, foxes, and wolves) was re-

ported destroyed, at a total cost of \$508,872.13, or an average cost of \$35.04. To be sure, large numbers of other animals were killed also by the warden-hunter's traps, guns, and poisons, but these were mostly porcupines, migrant hawks, woodchucks and other species which were beneficial, neutral, or negligible as regards their effect on game. Inasmuch as game was the chief concern of the sportsmen whose license fees paid for the system, they didn't like it. So much dissatisfaction arose that demands for discontinuance of the warden-hunters and renewal of the bounties finally prevailed. . . ."

The cost of fox removal on the Seneca County, New York, fox pheasant study is given by Benson (1948). See Table 1.

Darrow (from personal letter) explains this table as follows: "The trapping was done as part of an experiment to test the effect of as complete fox control as was possible to achieve. Therefore, trapping operations were continued throughout the winter beyond the time when practical effectiveness could be expected. In connection with fox trapping by State trappers as a means of thwarting

Table 1. Comparison of cost of fox removal at various levels of abundance (1947-48)

Month	Trapping costs	Number days trapping	Number of foxes taken	Cost per fox	Approximate per cent population reduction
August .....	\$2,354.01	197	133	\$17.70	0 to 24
Sept. .....	2,304.67	190	104	22.16	24 to 43*
Oct. .....	1,168.22	92	95	12.30	43 to 64**
Nov. .....	684.04	60	63	10.86	64 to 75
Dec. .....	774.19	62	27	27.67	75 to 80
Jan. .....	922.50	71	13	70.96	80 to 82
Feb. .....	1,014.00	79	14	72.43	82 to 84
Mar. .....	1,041.70	86	2	520.85	84 to 85
Total .....	\$10,263.33	837	451	\$22.76	

\* 6 additional foxes taken by private trapper.

\*\* 20 additional foxes taken by private trapper.

ng the spread of rabies in this State, the cost per fox taken has been about 16.00. In this operation, trapping has been suspended during the winter when conditions were unfavorable."

In Pennsylvania, seven paid trappers were hired on an experimental basis as of March 1, 1949. By July 1, these men had taken 509 foxes at an average cost of \$19.13. At this time the number of trappers was reduced, but by October 31, a total of 1,031 foxes had been trapped at \$13.56 per head. Obviously, fall trapping was most productive. Altogether, from March 1 to October 31, 5,676 predators or destructive animals were taken, including red and gray foxes, crows, skunks, opossums, hawks, owls, house cats, stray dogs, weasels, raccoons, porcupines, and snakes at an average cost of \$2.46 per animal.

(2) Reduced take of predators. How many paid trappers would be

required to take the millions of predators killed for bounty each year? Could enough be hired, at somewhere near reasonable costs, to accomplish the same degree of reduction, providing the same degree of reduction is desirable? For instance, could a reasonable number of paid trappers have taken the 48,000 red and gray foxes that were killed by private hunters and trappers in Pennsylvania during 1946-47 or would it have taken 100, 200, or more? It is doubtful whether 100 trappers could average 480 foxes each, and unlikely that 200 trappers, even if that many could be hired, could take 240 apiece during the year. Even if 200 paid trappers could have killed 48,000, which is doubtful, the total cost of such an effort would probably exceed \$750,000. The \$4 bounty for the 48,000 foxes cost only \$200,000.

(3) Resentment on part of local trappers. Particularly in eastern



PGC Photo

*State hunters may be of value in controlling the large predators in isolated areas.*

states, individuals who trap or hunt for profit or recreation are likely to resent the competition offered by state trappers. These people feel that the fur should be harvested by the land-owners and local residents of the region, and that the state is literally taking from them the recreation and revenue which is rightfully theirs when paid trappers or hunters are sent into their district. Often-times this animosity is expressed by the destruction or theft of traps or other equipment and a general campaign of interference on the part of the local residents.

(4) Even paid trappers and hunters may not all be honest, and, by careful "management" of the predators so that they are not reduced too low in any one area, the unscrupulous trapper can assure the continued "need" for his services.

It appears, then, that the paid trapper or hunter system may be practical and effective for the control of certain large predators, particularly those restricted both in range and numbers, but that this system may be too costly for generalized use in the control of smaller predators which may be quite abundant and widespread. Also, in highly-populated states, the paid trapper may encounter a resentful local population.

#### "Vermin" Control Campaigns

Of the several possible methods for controlling predators, the cooperative effort of sportsmen's groups or banded farmers, at least as ordinarily conducted, is one of the least desirable, or, as some wildlife biologists view it, one of the most undesirable. Emlen and Glading (1945) express the sentiments of many biologists when they say: "Indiscriminate destruction of predators, as attempted by many enthusiastic and well-meaning groups, is not effective control; these typical short-lived campaigns over an entire township or county do no lasting good, since only a small percent-

age of the predators living on the tract are ever eliminated and since the normal increase and migration of survivors quickly cancel the small gains made. Furthermore, such efforts usually include any and all hawks and owls, many of which are beneficial rather than injurious to game-bird populations. Although the numbers of useful birds destroyed by such ill-advised campaigns are probably not large enough to do much permanent harm, it is deplorable that sportsmen fail to recognize their natural allies."

As will be shown in a later section of this report, many game protectors or wardens cannot identify the various hawks and owls, even in the hand. The average sportsman or farmer, with very few exceptions, knows only one kind of hawk—the "chicken hawk." In fact, most members of this group are surprised to learn that there are no "chicken hawks" or "hoot owls" listed in bird guides. Further, they believe that the degree of destructiveness is proportional to size—the larger hawks being the most harmful. Of course, on the average, this is the reverse of the true situation.

Coupled with this inability on the part of the participants to distinguish beneficial from harmful predatory species, vermin control campaigns are often conducted without technical advice or supervision. Thus, there is often a spirit of competition, often with prizes for the top scores, and in the enthusiasm of the hunt almost anything that could be considered predacious, or that remotely resembles any predator, may be shot.

#### Poisoning

Much controversy has centered around the use of poisons in the control of predatory animals. The defenders, in the words of Goldman (1930), say: "While poison is objectionable it is by far the cheapest and most efficient known agent for

lealing with coyotes and various kinds of injurious animals, including the rodents, where they are abundant and conditions are suitable." There is no denying that if large numbers of predators or rodents, for some pressing economic reason, must be removed quickly, the use of poisoned baits, cyanide guns, or other poison techniques is by far the most rapid and most productive method known. Speed, thoroughness, and low cost are certainly arguments in favor of poisoning.

Perhaps foremost among the objections to the use of poison is that valuable furbearers and other desirable birds and mammals often take the "bait" and are killed. This loss is regrettable and should be prevented whenever possible. Trained government and state predator control men are developing techniques by which this loss is greatly minimized, and the objection is not so valid as it was some years ago. A second criticism concerns the waste of valuable fur. If destructive furbearers, such as the coyote, could be controlled to levels compatible with economic interests by trapping or hunting during the season when furs are prime, this would certainly be preferable, but many times the more running species cannot be easily checked in this manner. Especially when fur prices are low and the private trapper lacks the incentive to offer much aid in the control of these predators, poisoning by federal or state men may be the only effective means for relief. At least it is illogical to permit a "sheep-killing" coyote to continue its destruction throughout the summer and fall so that its hide might be worth three or four dollars when finally taken during the winter.

Poison should never be used by inexperienced or untrained persons as a control measure. When private poisoners "scatter poisons as if they were hand-sowing wheat," as one writer put it, more harm than good

may be done. At one time it was the practice for western cattlemen and sheepmen to carry a bottle of strichnine in their pockets and to "salt" every dead carcass they came across "without any thought of its possible effect upon carnivores in general." (Henderson, 1930)

Continued experimentation may evolve techniques or poisons which are specific for animals needing reduction, and, for certain species or under certain conditions, the use of poison may be an acceptable method of control in the hands of experts.

### Hunting and Trapping for Fur and Recreation

Because *fur value* and *esthetic and recreational values* were discussed under the topic "Arguments opposing predator control," little more needs to be said here, except that, if the numbers of all destructive predatory animals could be controlled to the levels most compatible with the economic interests of man by harvesting the annual surplus for fur or recreation, this would be the most nearly ideal control method of all.

It matters little to many men whether they hunt for game which they can eat, for fur which they can sell, or for the thrill and trophy which come with hunting the larger predators such as mountain lions and wolves. In any case, it is the recreational enjoyment which they value most, and there are many, many thousands who derive greater pleasure from hunting predators than from the more conventional game hunting. There is no doubt that if proper publicity were given these "off-season" forms of outdoor recreation, other thousands of sportsmen would become converted predator hunters. This would have the double-barreled effect of helping to control predator populations and of satisfying sportsmen in areas where game is not abundant. Oftentimes hunters who have learned to appreciate the



PGC Photo by Latham  
*Fox hunting is enjoyed by the rich and the poor alike.*

sporting possibilities offered by these animals will hunt them in preference to game; thus some of the pressure on game animals may be relieved.

Because fur is an economic asset, a natural resource, and a means of livelihood for many rural dwellers, there can be no question but that the fur-bearing predators should be harvested for their fur at a time when it is most valuable. However, when the market price is poor on certain predators, as it is at present, the financial return may not be sufficient to cause trappers or hunters to attempt large catches. When fur prices are low the private trapper cannot be depended

upon for control, and the adoption of some other method may be necessary. This brings up the question of bounties, paid hunters or trappers, vermin control campaigns, poisoning, and other control measures.

#### Biological Control

About all that can be said concerning the biological control of predators is that practically nothing is known about the subject and practically no studies have been made nor experiments conducted. The introduction of diseases, parasites, or large predators as a means of predator control would be a risky business

ven with a tremendous amount of previous research. This method of control awaits the scientist with a vast amount of knowledge and a vast amount of courage.

## THE BOUNTY SYSTEM—

### Advantages

*Increases kill of predaceous species.* Although some seem to doubt that bounty payments increase the kill of predatory animals, there is definite evidence that at least under certain conditions these payments do materially increase the take. Whether bounties are effective or non-effective in this respect seems to be entirely a matter of economics. If a fur bearer is already commanding a high price on the fur market, i. e. red foxes at \$10 or \$12, the addition of a \$2 to \$4 bounty may have little influence upon the total number trapped or shot. However, if foxes are selling at \$1.50 or \$2, the addition of a \$4 bounty may make an appreciable difference. In fact, merely raising the price of the bounty is often reflected by an increased effort upon the part of the trapper. The records of Pennsylvania's notorious bounty system illustrate this. In 1922, 351 bobcats were killed in Pennsylvania when the bounty was \$8, but raising the payment to \$15 in 1923 resulted in the taking of 617 cats. Similarly, raising the bounty on gray foxes from \$2 in 1922 to \$4 in 1923 stepped up the kill from 4,530 to 7,730 foxes. And inversely, lowering of the weasel payment from \$1 in 1936 to \$0.50 in 1937 reduced the take from over 80,000 to 29,000. When the \$4 bounty was removed from the red fox as of July 31, 1949, several professional fox trappers, whom the writer knows personally, simply stopped trapping foxes altogether. Many of these men had caught from 50 to over 100 each season for the several previous years the bounty had been in effect, but

they were now unwilling to expend their time, energy, and gasoline to trap almost entirely for pleasure since the fur of red foxes was almost worthless. Some who persisted in trapping gray foxes for bounty were releasing the red foxes they caught in hopes that this fox would be returned to the bounty list in the near future.

*Added income for rural populations.* Gerstell (1937), speaking of Pennsylvania, says: "The general economic effects of the bounty system are of no small import. The distribution of approximately \$1,880,000 in cash over a period of twenty years to thousands of persons living principally in the rural districts has meant much to many farm families and it is upon those very landowners that a large part of the supply of small game must depend for the production of range conditions favorable to its welfare."

The distribution of bounty monies among rural landowners is undoubtedly welcomed by them, but many do not believe that farmers should be subsidized for their part in game production in this manner, particularly when, as in Pennsylvania, the money comes entirely from contributing sportsmen. In any case it is not good management for the conservation department, or the political subdivisions, of states to spend the money of sportsmen or tax-payers merely to provide an additional income for rural hunters and trappers unless the bounty is actually accomplishing the intended purpose—the reduction of livestock losses or the maintenance of shootable surpluses in game populations. The distribution of wealth should certainly be only incidental to the main purposes of bounty payments.

*Stimulates interest in trapping and hunting.* Perhaps one of the most valuable of the "hidden" benefits is the extra stimulus which moves a boy to buy a half-dozen traps and

begin trapping. Whether he is a farm lad who sets his traps on his father's land, or a boy from town who must walk out into the country, both are being introduced to the many tangible and intangible benefits of the out-of-doors. Any form of motivation, no matter how abstruse, that initiates an appreciation of Nature and causes any member of our modern society to utilize the blessings of outdoor recreation for the preservation of his physical and mental health, can surely be considered a worthwhile contribution.

*Educational benefits.* Gerstell (1937) lists three possible educational benefits from the use of the bounty system of predator control:

(1) It provides a means for acquainting the many thousands of bounty claimants with the work of the game commission and arouses an interest in this work.

(2) It educates the public to the need for predator control, Gerstell questions the validity of this educational benefit, however.

(3) It teaches the hunters and trappers to distinguish between "good" and "bad" hawks and owls and perhaps reduces the number of beneficial or harmless forms killed.

*Investigative benefits—taxonomy, distribution, reproduction, food habits, etc.* It is obvious that the receipt of hundreds of thousands of bodies or pelts of predatory animals over a period of many years offers an unique opportunity for research studies. In Pennsylvania, all hawks and owls must be submitted entire within 48 hours after killing and the exact location and date of killing must be given, so that the hundreds of fresh samples are ideal for food habits studies, taxonomic measurements, studies of diseases and parasites, distribution, cyclic tendencies, invasions, and other purposes.

Although only the dried skin of bountied mammals is required in Pennsylvania, the distribution, the

cyclic nature, species ratio, specie movement, diseases (mange), ecto parasites, and other pertinent information can be secured.

If recognized and properly utilized the scientific knowledge which can be gained from a study of specimen submitted for bounty may at least partially pay for the cost even though the primary purposes of the bounty are not accomplished. This opportunity for study is of undeniable value.

### The Bounty System—Disadvantages

Several of the more important disadvantages of the bounty system will be discussed in some detail. A part of these and others are summarized by Jacobsen (1945):

#### "Objections to the bounty system"

(1) They do not encourage concentration of efforts against individual livestock and game killers

(2) They do not encourage work when and where most needed, e. g. in the difficult terrain of summer stock ranges, or to protect valuable game species.

(3) They permit hunters to concentrate their efforts during the season when pelts are prime, and to leave predators unmolested at other seasons.

(4) Their early apparent value in turning in large numbers of animals dwindles until those left for 'seed' build up a population sufficiently large to make bounty hunting profitable again.

(5) They lead to fraudulent practices such as:

(a) Making claims for predators taken outside the paying state or area.

(b) Releasing trapped females to maintain a breeding stock.

(c) Submitting counterfeit or substitute parts of animals not legally eligible for bounty collection.

(6) They encourage theft of animals and equipment from coopera-

ve and other law-abiding trappers. (7) They do not provide means for meeting emergencies, such as rabies outbreaks, or excessive livestock or game killings concentrated in isolated regions.

(8) The tax imposed to cover bounty payments seems at times to be an extra burden on livestock owners, in that it returns so little in the way of predator control that they feel obliged to hire trappers at their own expense."

*Usually ineffective in controlling predator populations (at least as commonly used).* Many tables could be presented which would show that counties do not usually effect a control of predatory populations and numerous references could be given to corroborate this fact, but so many

other writers have discussed this point that it seems useless to repeat what has been said so many times before. Those who should like to review concrete examples should read Gerstell (1937), Douglass and Stebler (1946), Hamilton (1946), Callison (1948), Bradt (1943), Jacobsen (1945), and Pearson (1933).

It is admitted freely that, as commonly used, bounty payments do not usually control predator populations; however it is altogether likely that *any predatory animal can be controlled by bounty payments if these payments are high enough.* Again this is merely a matter of economics. If men are able to make more money trapping predators than by more ordinary labors, they will trap and continue to trap so long as it re-

*Trapping and hunting for bounty is big business in Pennsylvania. Oftentimes hundreds of pelts are processed daily in the Bounty Office at Harrisburg.*

PGC Photo by Batcheler



mains more remunerative than other work. But as predators become scarcer and the total take per trapper becomes less, it would be necessary to increase the bounty to insure their continued effort, but eventually control would be achieved. When the bounty on wildcats in Pennsylvania was raised from \$8 to \$15 in 1923, the take for that year was 617. Then followed a gradual reduction in the annual kill until by 1936 the wildcat had been nearly exterminated. The bounty was removed completely in 1936 because control had been effected, and normal mortality from deer and bear hunters, from hunting the cats with hounds for sport, and from accidental trapping (mostly fox sets) has kept the bobcat population from showing any appreciable gain since that time. However, this was a moderately-large predator; it had a comparatively-low reproductive potential; it did not possess the trap-shy qualities of foxes, coyotes, and wolves; and there were probably less than 5,000 in the entire state when the bounty was first initiated. During the same time there were probably at least 40,000 to 60,000 red and gray foxes and probably 150,000 to 250,000 weasels.

If the natural environment is sufficiently favorable to permit a predator population to build up to large numbers, the consequent reduction and control of this population is likely to be difficult and moderate bounty payments will usually be ineffective. Unless more individuals of a predatory species are removed by trappers or hunters than are born and successfully reared each year, then bounty payments cannot cause a reduction of numbers. When it is considered that a spring breeding population of 25,000 red fox vixens is capable of producing at least 125,000 offspring, and that, if most of these survive, it will be necessary to remove 100,000 to 125,000 before the next breeding season to prevent an

increase, the immensity of the predator control task becomes evident.

Grange (1949) makes an interesting observation concerning the ineffectiveness of the bounty system "The charge is sometimes made 'We have been paying bounties on Coyote and Foxes for twenty years, yet we still have Coyotes and Foxes.' This charge, at least, is no reason to condemn bounty systems, for the purpose of control is *never* extermination of a native species. So, if bounty systems have invariably failed to exterminate native predators, this is one good argument that may be offered in their support!"

*Indiscriminate — beneficial and harmless species killed by mistake*  
This is another case where the "innocent bystander" gets killed. Animals not on the bounty list are destroyed in two ways: (1) by being shot by hunters who misidentify the species or who are incapable of identification (confined almost entirely to hawks and owls), and (2) by falling victim to traps or poison set for bountied species.

Not one out of a hundred sportsmen has the ability to identify most hawks and owls in the hand, and fewer still could "pass the test" of identifying these raptors on the wing or sitting at some distance. Even game protectors or game wardens do not qualify. During 1949, the writer tested the ability of a representative group of these men; each had been instructed in identification sometime during his career, all were regularly called upon to fill out affidavit forms for bounty claimants and "pass" upon the hawk or owl presented, and all were expected to participate in the control of predators as part of their official duties. The twenty-eight protectors, representing a typical cross-section, identified an average of 48 per cent of the seven study skins presented. One man guessed all wrong, and none of the twenty-eight was able to identify all seven. The

udy specimens were all of common, sident hawks, and all were typical the species. In fact, four of the ven skins were of the three unpro- cted species in the state.

Baldwin, Kendeigh, and Franks (1932) describe the indiscriminancy hawk control in Pennsylvania: "As illustration of the type of results at are obtained when state-wide adication is attempted of some ecies and not others, the recent ex- perience of Pennsylvania in 1929 may be cited. A bounty law was passed providing \$5.00 on all goshawks ken in the State. Within one year ter the law went into effect, 503 rds were taken into the office of e Pennsylvania Game Commission Harrisburg in order to secure the \$5.00 bounty. Out of this 503 birds ly 76, or 15%, were goshawks. ver 58% of all the birds taken were 'beneficial varieties.' (See Table )

They also speak of Ohio's experience with hawk bounties: Several years ago when a hawk law as in force in Ohio, the township erk at Wakeman issued 86 bounty rtificates. Of these 86 hawks killed, i, or 53.5%, were sparrow hawks, hich is a very beneficial species. his is to be expected in indiscriminate shooting of hawks, since our ensus indicates that 50.5% of all awks which one may meet in the eld belong to this species. . . . Conol measures designed to eliminate ertain species and not others are istinctly and unquestionably *inad- sable.*"

Table 3—Species and number of idividuals killed in state-wide radication campaign against the shawk in Pennsylvania, 1929 (from aldwin, Kendeigh, and Franks, 932).

Tailed hawk .....	165
ooper's hawk .....	120
ed-shouldered hawk .....	84
oshawk .....	76

Marsh hawk .....	28
Sharp-shinned hawk .....	9
Rough-legged hawk .....	7
Sparrow hawk .....	4
Broad-winged hawk .....	3
Duck hawk .....	3
Pigeon hawk .....	1
Osprey .....	1
Short-eared owl .....	1
Great horned owl .....	1

Handley (1937) discusses Virginia's experiences: "In Virginia during the period 1924-29 a state-wide bounty was offered on the head of the goshawk. Payments were made on 9,540 large heads, supposedly those of the goshawk, yet Dr. J. J. Murray, the well-known Virginia ornithologst, states that there is only one authentic record of a goshawk killed in the state."

Wherever traps are set for mammalian predators, whether the bounty is involved or not, other species, some of them beneficial or harmless, are certain to be caught. Pennsylvania fox trappers catch large numbers of raccoons, opossums, skunks, dogs, rabbits, and even some wild turkeys, ruffed grouse, and other game. Most of these animals are wasted, and even many of the furbearers caught incidentally to the fox trapping are taken when the fur is unprime and merely discarded. Of course, only a part of this economic waste can be charged against the bounty system since similar losses occur during the regular harvest of furbearers, predatory or otherwise.

The pole trap set for hawks and owls is also indiscriminate. Most often pole traps are placed to protect concentrations of game or poultry as around game or chicken farms, but there are some who use pole traps to catch hawks or owls for bounty. Unless skillfully placed and baited, pole trapping is not selective, and the beneficial hawks and owls are taken along with the destructive ones. If set lightly enough to take sharpshinned hawks, small birds of all



*Tally-ho!*

-Photo by Wm. M. Rittase

inds are caught; if set harder, so that small birds are safe, the large *Buteos*, the predominantly beneficial group, will be caught. Wight (1931) in speaking of the use of pole traps says: ". . . it seems wise to limit carefully the use of pole traps to those areas where game is concentrated in unnaturally large numbers, such as at game farms, or where it can be definitely established that damage of a serious nature is being done by species which can best be controlled by these devices."

There are those who believe that bounties are not only at fault in causing the indiscriminate killing of innocent species but also in causing the non-selective destruction of innocent individuals within a condemned species. Hausman (1927) defends this position: "If one should see a man in a blue suit making his escape after having robbed the house, and should thereupon sally forth into the street with a shot-gun and blaze away at every man in a blue suit that he happened to meet, he would be carrying out in practice the principle upon which many act when they wage indiscriminate warfare upon our native hawks." In other words, a state-wide bounty may cause the destruction of predatory animals in regions of the state where, because of varying faunal patterns, the species may be incapable of material damage. And too, even in areas where damages to livestock or game is evident, this destruction may be confined to the activities of a few individuals of a species. The bounty, however, is the same price for both the innocent and the guilty.

*Inefficient—bounties paid on animals killed accidentally or incidentally.* This is one of the strongest arguments against the bounty system, and, for certain species in certain regions, it is sufficient reason for abolishing bounty payments altogether. Even the most staid protagonists of the bounty system can hardly deny that

any sum paid for the elimination of a predator which would have been killed anyway is a waste of money. Some say that this may help repay those who have lost livestock to predators, but, at least from a game management viewpoint, it is wasted money.

What proportion of the total number of predatory animals taken are killed accidentally, incidentally, or in defense of personal property? This of course, depends upon the abundance of the species, the extent of its distribution, whether it is easy or difficult to trap or shoot, and whether it occurs in heavily or lightly populated regions. It should be obvious that fewer coyotes would be killed accidentally or incidentally in Nevada or Idaho than there would be foxes in thickly settled states like New York or Pennsylvania.

Latham (1951), in a study of Pennsylvania's bounty system for the fiscal years from 1948 to 1950, found that 58 per cent of the claimants for fox bounty presented only one fox; 29 per cent of the claimants presented from two to five foxes; and only 13 per cent had trapped or shot more than five. Only 3.6 per cent of the 6,690 weasel claimants for the 1949-50 fiscal year caught more than ten weasels during the twelve-month period, and about 50 per cent had killed only one weasel. Over 81 per cent of the claimants for horned owl bounty submitted only one owl, and only 2 per cent captured five or more.

The study also revealed that of the total number of foxes submitted for bounty, 73 per cent would have been killed without the added incentive of the bounty payment. Over 75 per cent of the weasels, 59 per cent of the horned owls, and 96 per cent of the goshawks would have been killed whether a bounty had been in force or not.

A certain number of predators are found dead upon highways, or are killed by farm machinery, or, in the

case of weasels, may be brought home by housecats. *These may be bountied, too.*

Another type of inefficiency not generally considered by the opponents of the bounty system is the payment of money for the killing of predatory animals from regions where they are not seriously conflicting with man's economy or man's pleasures. In western states, the removal of coyotes, wolves, or mountain lions from regions that are not utilized for cattle or sheep grazing and are so inaccessible that the hunting possibilities are little exploited may be of little real value. Even in the East, for instance Pennsylvania, there is considerable doubt whether the taking of foxes, weasels, goshawks, and great horned owls from the "big woods" country, which is primarily deer and bear range, actually contributes much to hunting success in those areas. On the other hand, on agricultural land, where the bobwhite quail, ringnecked pheasant, and cottontail rabbit are found in greatest abundance, predator control may be far more efficient because the utilization of game, both by predators and by hunters, is much more intense. Of course, a region in which predators are not controlled may act as a reservoir to keep "controlled areas" continually stocked, but little is known concerning the extent to which this occurs.

*Impractical—costs often too high for results obtained.* In order for any enterprise to be practical, the return should exceed the output, and whenever a large margin of profit is realized it is considered good business. The elementary question, in regard to the bounty system is—does the expenditure of \$10 in payment for the killing of a predatory animal either save \$10 plus worth of live plus worth of game for hunting? It stock or provide an additional \$10 is true that the question is elemen-

tary, but who can profess the omniscience necessary to answer it?

This "balancing of the books" a most difficult task. Many critics of Pennsylvania's bounty system state that it is impossible to show that the immense sum spent for the control of predators (over \$3,000,000 since 1915) has contributed to an increased kill of game in the state. Since a bounty on predators has been in effect constantly throughout the entire state since 1915, it is much like a scientific experiment without a control—noting can be proved nor disproved. Consequently, no one can show that the bounty has or has not helped Pennsylvania's hunting. Who can say what it might have been if no bounties had been paid during these years?

There is reason to believe that the control of large predators in the West as a protection to livestock or big game may be a practical undertaking, at least under certain conditions and on certain areas. But there is much less evidence that the control of small predators by means of the bounty as protection for small game is a paying proposition. Even this is a matter of relativity. It is now generally accepted that the artificial propagation and stocking of most game is impractical; but it is still widely used with crossed fingers, as a means of increasing the game supply. Other management efforts may be impractical. Therefore, it may not be such a matter of deciding whether controlling predators by means of a bounty system is practical or not practical, but, instead, whether it is less practical than other commonly used management measures.

Crissey and Darrow (1949) in reporting upon the predator control experiment on Valcour Island in Lake Champlain, New York, stated that the control efforts produced a substantial increase in numbers o



Photo by W. Bryant Tyrrell

The Bald Eagle, our national emblem, is a bird of prey but lives on fish. The only eagle sanctuary in the United States is located in Pennsylvania on Mt. Johnson's Island in the Susquehanna River near the city of Lancaster.

ruffed grouse and snowshoe hares for three years, but, at the end of that time, disease and possibly other factors caused a marked decline in numbers. They estimated that the same amount of control as practiced upon Valcour Island to produce the temporary increase of game, if applied to the entire state of New York would cost at least \$10,000,000 annually.

*Conducive to fraud.* Wherever or whenever there has been a bounty, there have been attempts to collect payment fraudulently. Sometimes these attempts are made by innocent persons who are ignorant of certain regulations governing the payments of claims or are incapable of making correct identification of predatory animals on the bounty list. But by far the greatest number of the fraudulent claims are made by persons who are aware of their deceit.

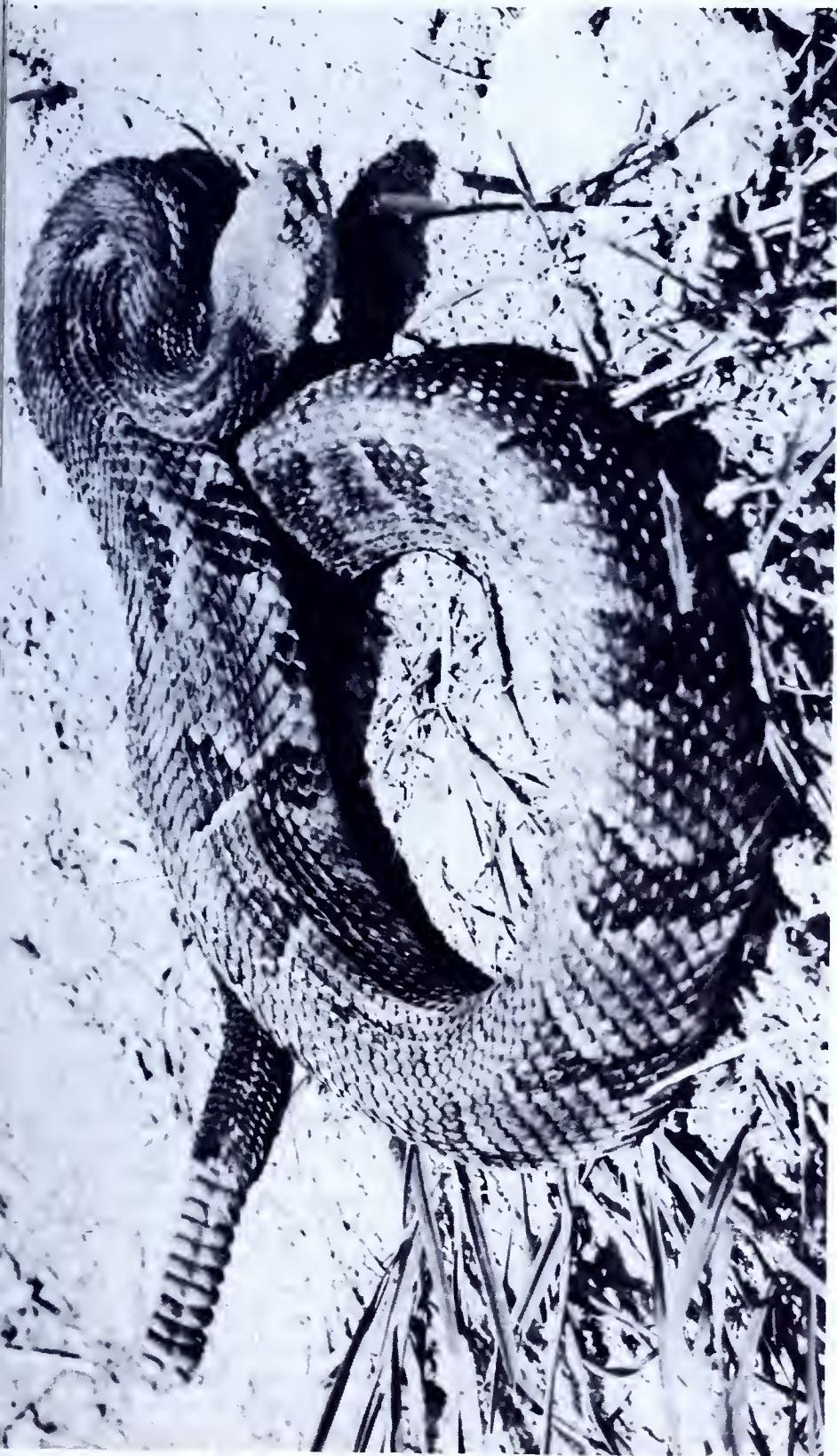
Gordon (1923) indicates the extent of fraud in the early Pennsylvania bounty system (1913-1915): "Many justices of the peace, incompetent to identify various species of birds and mammals, prepared certificates to the county commissioners on the strength of a statement made by the claimant. In many instances, justices of the peace passed red squirrels, flying squirrels, and wood rats for weasels; all sorts of animals for foxes; domestic cats of various sizes and colors for wildcats; birds of all kinds, including practically everything from the heads of domestic fowl, gathered up at slaughter houses, to the heads of all species of hawks and owls, even the heads of game birds, for the two hawks and one owl on which bounties were offered by the 1913 law. In a number of other instances, I regret to admit, investigations developed that officials authorized to administer oaths were disposed to do almost anything for a dollar, and with the aid of individuals of low repute made up

affidavits and certificates for the killing of vermin of various kinds without a single hair or feather of any sort being presented. Between officials who were imposed upon because of their inability to identify various species and those who deliberately aided in collecting fraudulent bounties, the total amount of money claimed from the hunter's license fund during the twenty-one months the law was in force was more than \$350,000."

Handley (1937) cites a somewhat similar experience in Virginia: "As is evident from what has already been said, fraud was rife in the system. Investigation disclosed that not only the scalps of all kinds of hawks were being brought in for bounty, but also the upper bills of chickens and the heads of such protected song and insectivorous birds as the mockingbird, the robin and the bull-bat or nighthawk. Trophies from other states were brought into Virginia wholesale for the bounty, in spite of the fact that a sworn statement was requested, declaring that each scalp was of a certain species and was taken in Virginia."

Another instance of fraud in connection with the hawk bounty was reported by LeCompte (1931): "In Dorchester County where the majority of hawks are killed, the natives have a habit of putting the heads in a tin can and placing salt over them which naturally forms a brine within a few days and when they were presented for inspection, it was nearly impossible to tell the species."

Bounty fraud has taken some peculiar twists, and in some cases has shown pronounced ingenuity on the part of the claimant. Hamilton (1946) cites several cases: ". . . Over the years, counties in mid-western states have paid bounties on ground squirrels, which pilfer some grain. Usually the tail only must be presented when the bounty is claimed. A student once told me that the



*The timber rattler is a predator which respects neither man nor beast.*

Photo by Hal. H. Harrison

pregnant females are trapped alive in the spring, the tail cut off and the animal released. The female is in no way impaired from raising her family and thus producing another litter of tailed young ones for the trappers to operate upon. Some unscrupulous trappers even split the tail lengthwise with a razor blade, thus doubling their stakes at the moment the former owner was nursing a litter of young squirrels. . . . In 1937 an investigation was started and it was found that one man sent in 560 coyote pups [at \$2 each in Montana]. All of these were skinned, and the pelt was tanned. Critical examination of these pelts revealed them to be gophers. . . . In central Washington during 1925, an investigation disclosed that wildcat skins were being shipped in from Mexico to Texas and then to Washington and British Columbia. The bounty was paid by a girl in the auditor's office who didn't care whether it was a wild cat or a house cat. Some hunters were paid as high as five or six thousand dollars. . . . Not long after this incident another bounty hunter entered the state and proceeded to present for bounty 35 bobcats in one county, 48 in another, 30 in another, and 40 in still another [pelts marked by removing feet when bounty was paid.] Investigation by the county officials, whose suspicions were thus aroused, led to the man's arrest. In his car were 75 bobcats and a sack containing 356 extra bobcat feet. Close examination showed that the feet had been sewn onto some of the skins. . . . Some years ago, cobras became too abundant in India, so officials offered a bounty on the snake. The natives dug up the nests, incubated the eggs in regular hotbeds and successfully raised the young that they might collect bounties on the snakes."

The ability to "outwit" the bounty officials is not confined to adults. A

good example of this is given (Ano 1949): "In the past a bounty was paid on magpie and crow eggs. The method of payment had to be discontinued when it was found that many youngsters would take all but one egg out of the magpie or crow nest on the theory that the mother bird would come back and lay some more, and they would have a continuing source of revenue." An from Douglass and Stebler (1946) ". . . More than one subsequent respectable citizen can recall boyhood excursions to the town clerk office with a fragrant assortment of crow and woodchuck heads, to receive the bounties thereon. Once the funds were pocketed, the next move was rapid withdrawal to a point offering a discrete view of the town trash can. With luck the specimen would soon be thrown out, ready to be retrieved for bounty another day. . . ."

How can fraud in the bounty system be reduced to a minimum? From a study of the mechanics of various bounty systems, both past and present, it appears that the most efficient in terms of minimized fraud fulfill the following requirements: (1) The responsibility for the operation of the bounty system should be vested in a qualified conservation agency, not in an elective, law making body; (2) the operating organization alone must possess the power to place any species of bird or mammal on the predator list, or to remove it therefrom, to set the rate of bounty payment, and to declare the areas for and periods of their effectiveness (1 and 2 from Gerstell, 1941); (3) all carcasses or all hides from the entire state should be sent to one central bounty office (county and township bounties are notoriously susceptible to fraud where full-time "experts" can check their identity and mark the returned pelts so that they can be recognized if the claimants attempt to collect



PGC photo by Latham

*When pelt prices are low as they are at present for long-haired furbearers, there is little criticism of warm weather trapping.*

bounty twice on the same pelt; (4) whenever the validity of a claim is questioned by the trained personnel, there should be adequate provision for full investigation backed by the authority for just and impartial prosecution of all offenders; (5) hawk and owl skins should be submitted to the central office (where they are destroyed or utilized for scientific studies) within a specified time limit; this restriction precludes the possibility of much importation from other states; and (6) the entire, uninned, but dried, hide of fur animals should be required so that easy identification is possible and importation becomes more costly and difficult; furs should be returned. The system described is essentially that used by the Pennsylvania Game Commission.

*Economic waste—furbearers taken when fur is not prime.* Some criticism concerning the economic waste caused by the bounty system is deserved. The extent of this waste is usually exaggerated. When fur prices are high on predatory animals for which bounties are being paid, most trappers and hunters of their own volition wait until the furs are prime so that they can reap the double benefits. But when the pelts have little value and the bounty constitutes the principal return, then the hunter or trapper may continue his activities the year around. After all, is there much difference between \$5 and \$6, especially when furs become prime during the winter months when these animals are hardest to catch? The trapper who can catch 50 foxes in October at \$4.50 to \$4.75 is better off than the

man who waits until December and only catches 25 to 30 foxes at \$5.50 to \$6. When furs have little or no value, they cannot be considered an important natural resource, and, temporarily at least, the taking of these animals when pelts are unprime is not a serious economic waste.

Sometimes keen competition between trappers will cause one to start early "to beat the rush," and then the others are likely to follow suit in an effort to get the share. Such matters can often be straightened out by the trappers themselves if they show a willingness to cooperate.

## The Control of Domestic Predators

It is ironical that many of the men who are most vociferous in damning wild predators are at the same time guilty of permitting their own household pets—their cats and dogs—to run at large and kill game whenever the opportunity presents itself. The roaming dog and the hunting cat are among the most destructive of all predatory animals and their combined depredations upon livestock and game probably equals that of any two wild predatory species in most of the heavily populated states of the East. Any wildlife worker who has many contacts with owners of cats will hear of the wonderful exploits of "Tiger" who "brought 37 young rabbits in to her bunch of kittens this spring" (this is said with a definite show of pride in the cat's hunting ability), and of "Priscilla" who "just catches lots of little birds, but she needs raw meat to keep her coat soft and shiny, doesn't she?" Nearly every life history study of game birds, whether it be on ringnecked pheasants, bobwhite quail, Hungarian partridges, woodcock, ruffed grouse, or others, points to the house cat as one of the chief offenders in killing incubating females and destroying the nests. Its destructiveness to cottontail rabbits, newly hatched game

birds, and recently released, artificially propagated game birds need no emphasis.

Forbush (1916), Pearson (1933), Henderson (1927), and many, many others have made eloquent appeal for the control of the vagrant cat to no avail. Because the general public is suffering from a conservation blindness for which there appears to be no immediate cure, it seems foolish for the writer to add more wasted words to what has already been said. But he should like to leave this thought with the reader. If man is going to continue to ignore the depredations of his domestic animals, over which he possesses the power of complete control, is it fair to condemn and to persecute wild predators, many of which are far less destructive than his cats and dogs and all of which possess admirable qualities lacking in most of the half-fed, mongrel dogs and cats running at large? Perhaps far fewer wild predators would need to be killed to accomplish the goal of game management—sustained game production for recreational purposes—if the numbers and the activities of cats and dogs, the simplest of all predators to control, were carefully restricted.



Photo Penna. Game Comm.

The barn owl, screech owl, and long-eared owl (pictured above) are three desirable predators which can be encouraged by building nesting boxes and providing thick evergreen cover.

## Management of Desirable Predatory Species

Much thought has been given to the values of certain beneficial predators, but few attempts have been made to utilize the services of these animals for the public good. If a few barn owls or screech owls scattered here and there are of such material benefit in the reduction of the numbers of rodents, why should not twice that many or ten times that many perform a proportionately greater service for mankind?

Many wildlife workers have suggested the management of desirable predators. Adams (1925) states: ". . . The proper use of predators in the areas of extensive agriculture is probably today one of the most important predatory problems needing careful study. In the less extensively cultivated areas the predatory animals will not only do relatively little harm, but they can do positive good in controlling rodents, and in providing an annual crop of furs; and it is in just such conditions that we should consider giving them all the protection possible . . ." And Bailey (1918) adds: "If the Sparrow Hawk or Screech Owl were not only managed but propagated they would do more in the way of ridding us of insect pests and other vermin, such as mice, etc., than all the cats in the vicinity."

Some suggestions have been made for management techniques. Emlen and Glading (1945) suggest nesting shelters: ". . . Studies have shown that a single barn owl can take more than 4,000 mice from its beat in the course of a year. Such a bird should be rigidly protected and even encouraged on a quail range. Roofed wooden boxes or small barrels provided with a 4- or 5-inch entrance hole make excellent shelters and nesting sites for barn owls when placed on poles or wired in trees at 10 to 15 feet above the

ground. The establishment of such boxes helps in quail conservation.

Allan (1942) cites a case where predator management was actually practiced: ". . . An instance known to the writer in which Pennsylvania orchardist was able to attract many screech owls to his land by furnishing bird boxes. During one year he had 13 or 14 pairs using the boxes, and was satisfied that they had an appreciable effect on the mouse population. Sparrow hawks, barn owls, and barred owls might be attracted in the same way. He also captured black snakes and other non-poisonous species and released them in the orchard, although the success of this measure is unknown. Skunks also were protected by this orchardist and various shelters such as tiles were provided for them."

He continues: "Bond [Bond and Borell, 1939] states that the Soil Conservation Service advocates the erection of poles with cross perches in treeless alfalfa fields to attract barn owls for the control of meadow mice; while Leopold (in conversation) suggested small plantings of cottonwoods, well scattered in the Plains area, to attract nesting hawk and great horned owls. E. Lowell Sumner, Jr., in a letter, tells of a relationship of eucalyptus growth to barn owl populations of considerable value. Hedgerows of tall, dense-topped trees were found to harbor large numbers of owls, and to provide nesting and roosting sites for red-tailed hawks, sparrow hawks, and screech owls, as well. In a 4-acre woodlot Sumner noted a relatively stable population of 50 barn owls that persisted until the woodlot was cut down.

"The writer here suggests, for study purposes at least, the possibility of attracting burrowing owls to sites

pulated by kankaroo rats. A post-hole digger might serve to start a lony. Cannot weasels, skunks, diggers, raccoons, swift foxes, and other predators of rodents be similarly encouraged?

"From a practical standpoint efforts to increase the animals predacity on rodents probably should be accompanied by measures to expose the prey to them."

Germany became alarmed at the scarcity of hawks and owls, and, with the added scare of a mouse plague in the upper Rhine Valey

during 1931 and 1932, established an owl farm where the great uhū, of the same genus as our great horned owl, is being raised and re-introduced into areas from which it had been exterminated (from Pough, 1938).

The few quotations given indicate that wildlife men realize the potential value of beneficial predators, particularly as an aid in the reduction of the numbers of small rodents. Farmers and orchardists should welcome the services of the

*Is it fair for man to condemn and persecute wild predators when he ignores the depredations of his domestic cats and dogs?*

PGC Photo



farms which live principally upon these small mammals and should encourage them at every opportunity. It is likely that a barn owl will kill

more mice and rats around a farm than a half-dozen ordinary house cats, and, unlike the cats, barn owl are seldom destructive to game.

## Fifteen Cardinal Points of Predation

1. The term "predator" does not necessarily denote a destructive animal. Some of the animals most beneficial in respect to man's economy are predators.

2. Predators considered most injurious may under certain conditions be decidedly beneficial, and those recognized as harmless or beneficial may at times or in certain places be definitely destructive.

3. The most destructive predators, when occurring only sparsely, can have little effect upon the total numbers of desirable prey species, but an only slightly destructive predatory animal, if it occurs in sufficient abundance, can become a potent decimating agent.

4. Generally speaking, predators live on the annual surplus produced by a prey species, and their influence seldom causes a serious reduction in succeeding breeding populations.

5. Except under the most extenuating circumstances, no predator except man will ever exterminate a prey species.

6. Because animal populations tend to increase toward self-destruction if not held in check by certain counterforces, predation, as one of these reduction factors, may be considered a beneficial service for most prey species. In fact, predators may be an important factor in the survival of some prey species.

7. The net effect of predation upon a particular prey species is measured, not in terms of its percent occurrence in the predator's diet, but in terms of the numbers lost to predation in relation to the total population of the prey species.

8. Food habits figures for predators have comparatively little significance unless accompanied by specific ecological data concerning both the predator and its prey from the region where the food samples were collected.

9. Predator food habits figures are specific for season, year, and locality and it should never be construed that a predator's diet for one time or place will apply to any other time or place.

10. Within certain limits, availability, above all else, governs the diet of most predatory animals. The availability of prey animals may vary according to: cyclic influences, weather conditions, pathological or parasitological factors, the amount of protective cover, the adequacy of nutrition, and the introduction of exotic or artificially propagated prey animal.

11. A reduction of the number of predators on a given area does not necessarily mean a reduction in predator pressure on a specific prey animal.

12. Predator control may benefit a fostered species on areas where other environmental conditions are favorable for increase, especially when the numbers of the prey species are well below normal.

13. Predator control may be of value on areas where any considerable part of increase that would normally be utilized by man is being taken by predators. The need or value of predator control in game management is proportional to the intensity of the game harvest.

14. One of the principal stumbling



Weasels have bad reputations for killing poultry and small game, but the principal item of diet is mice. The Least Weasel pictured above lives almost exclusively on mice and is a real asset to a farm.

Photo by Maslowski & Goodpastor

blocks in the way of agreement upon the economics of predation is that most of those who favor predator control are thinking in terms of *individual* animals lost, while most of those who oppose control are usually thinking in terms of *species* or *population* survival.

15. Policies toward predators will always be governed by man's economic and esthetic interests and will

seldom be influenced by purely biological reasoning.

#### BIBLIOGRAPHY

A bibliography of 510 titles was included in the original technical bulletin. Those who are interested in a further study of this subject can obtain this list of references by writing for *The Ecology and Economics of Predator Management*.



PGC Photo by Forbes

*The pole-stage forest which now covers many thousands of acres of Pennsylvania mountains offers little protection to small game against predators.*

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# Pennsylvania Official 1952 Open Seasons and Bag Limits

Open season includes first and last dates listed. Sundays excepted, for game.\* The opening hour for small game on November 1, buck hunting on December 1, and antlerless deer hunting on December 15 will be 9:00 A. M. Otherwise, upland game shooting hours daily are from 7: A. M. to 5:00 P. M., but from July 1 to September 30 inclusive, 6:00 A. M. to 7:30 P. M. (All shooting hours based on Eastern Standard Time.)

BAG LIMITS			OPEN SEASONS		
	Day	Seasons	First Day	Day	Last Day
<b>UPLAND GAME</b> (Small game possession limits below)					
Bobwhite Quail .....	4 .....	12 ....	Nov. 1 .....	Nov. 15 .....	Nov. 15 .....
Ruffed Grouse .....	2 .....	6 ....	Nov. 1 .....	Nov. 29 .....	Nov. 29 .....
Wild Turkeys (see counties closed below) .....	1 .....	1 ....	Nov. 1 .....	Nov. 29 .....	Nov. 29 .....
Ringneck Pheasants, males only .....	2 .....	8 ....	Nov. 1 .....	Nov. 29 .....	Nov. 29 .....
Rabbits, Cottontail .....	4 .....	20 ....	Nov. 1 .....	Nov. 29 .....	Nov. 29 .....
Squirrels, Gray, Black & Fox .....	5 .....	20 ....	Nov. 1 .....	Nov. 29 .....	Nov. 29 .....
Squirrels, Red (closed October only) .....	Unlimited .....		All mos. except Oct.		
Hares (Snowshoe) Rabbits .....	2 .....	6 ....	Jan. 1 .....	Jan. 10 .....	Jan. 10 .....
Raccoons, by individual or hunting party* .....	5 .....	1 ....	Oct. 15 .....	Feb. 1, '53 .....	Oct. 15 .....
Raccoons, by trapping .....	5 .....	40 ....	Oct. 15 .....	Feb. 1, '53 .....	Oct. 15 .....
Woodchucks (Groundhogs) (closed October only) .....	5 .....	Unlimited .....	All mos. except Oct.		
Grackles (unprotected) .....	Unlimited .....		Unprot. to Sept. 1, '53 .....		
Bears, over one year, by individual .....	1 .....	1 ....	Nov. 17 .....	Nov. 22 .....	Nov. 17 .....
Bears, as above, by hunting party of three or more .....	2 .....	2 ....	Nov. 17 .....	Nov. 22 .....	Nov. 22 .....
DEER:	<b>Bow and Arrow Season</b> —Male with two or more points to one antler (requires hunting license and special archery license) by individual* .....		Oct. 13 .....		
	Regular Season—Male with two or more points to one antler, by individual* .....	1 .....	1 ....	Dec. 1 .....	Dec. 13 .....
	Antlerless Season—(requires hunting license and antlerless deer license) by individual* .....			Dec. 15 .....	Dec. 17 .....

**NO OPEN SEASON**—(Hen Pheasants, Hungarian Partridges, Cub Bears, Elk, Spike Bucks and Otter)

## FURBEARERS:

Skunks and Opossums .....	Unlimited .....	Unprot. to Sept. 1, '53 .....
Minks .....	Unlimited .....	Nov. 5 .....
Muskrats .....	Unlimited .....	Nov. 29 .....
Beavers (traps only), state-wide* .....	3 .....	Feb. 16 .....

## \* SPECIAL REGULATIONS

**POSSESSION AND TRANSPORTATION LIMITS** of legally-killed small game shall mean not more than the daily limit for the first day nor more than an accumulated total for each succeeding day of the open season for each species; but not in excess of the season limit, regardless where held, stored or found in possession.

**TURKEYS, COUNTIES CLOSED TO HUNTING**—Adams, Armstrong, Butler, Fayette, Greene, Mercer, Somerset, Venango, Westmoreland and York. In addition, that part of Cambria west Highway Routes Nos. 271 and 56; that part of Cumberland south of U. S. Highway Route No. 22 to the west shore of the Susquehanna River; and that part of Franklin south and east U. S. Highway Route No. 11 are closed.

**RACCOONS**—Hunting season begins at 7 A. M. on the first day, and ends at noon on last day (see instructions below concerning trapping). May be hunted day or night. Sundays excepted. The season limit applies to hunting and trapping combined.

**DEER**—Even though there are three separate seasons for taking deer, a hunter may not kill more than one deer during the three combined 1952 seasons, whether hunting individually or with a camp or hunting party. A Special Archery License is required during Bow and Arrow Season issued only by the Dept. of Revenue, Harrisburg, at a fee of \$2.00. Antlerless Deer Licenses are issued only by County Treasurers, at a fee of \$1.15, and valid only in the County for which issued. Farm occupants permitted by law to hunt without a license may also hunt for antlerless deer during the antlerless season on the same lands as for other game. See Digest issued with hunting license for details. Under the law, no application for an Antlerless Deer License shall be approved, or license issued, to a Nonresident prior to November 15, or after December 14, 1952.

**BEAVERS**—No trapping at Commission-posted dams. Nonresidents may not trap beavers. One person may set, tend or operate 10 traps only. Traps must not be set on the structure of a beaver dam or house, or within 25 feet of the waterline on the structure of either. Tags must be kept above ice or waterline to facilitate identification without disturbing trap. Pelts must be tagged within 10 days after season, and may not be sold or otherwise disposed of until properly tagged. Present them to the Game Protector in District or County where trapped.

**TRAPPING**—Traps for furbearers and raccoons not to be placed, staked or set before 7 A. M. on the first day of the open seasons. The season indicated for Trapping closes at 12:00 o'clock Noon on last day. Traps must be tagged with metal name tags.

**SNARES**—The use of snares is prohibited in all counties except by special permit.

## REGULATIONS FOR UPLAND GAME FIXED BY PENNA. GAME COMMISSION AT MEETING JULY 1, 1952.

1952 HUNTING LICENSE IS VALID SEPT. 1, 1952 TO AUG. 31, 1953, BOTH DATES INCLUSIV

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PENNSYLVANIA

# Game News



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OCTOBER 1952

10 CENTS



# THE STORY BEHIND THE COVER

**G**AME News readers will undoubtedly recognize the lady on the cover as Anna Johnson, the Mohawk Indian bow huntress from Summerville, who was first to report killing a deer in Pennsylvania's original special archery season last year. A newcomer to the bow and arrow game, Mrs. Johnson is typical of those thousands of Keystone State residents who have recently submitted to the magic lure of archery hunting.

To the uninitiated, hunting with the bow seems like an odd pastime. To the bow hunter, though, it is the ultimate in outdoor sport, a hunting game that gives the quarry unlimited advantages and makes the hunter *earn* his trophy.

Game hogs are practically unknown among modern archer-hunters. Since the bow is a short range weapon only the experts should attempt those bow-straining, long range shots one reads about. Most bow hunters are not certain of hitting a vulnerable spot on a standing deer at ranges exceeding thirty or thirty-five yards—and any deer hunter knows it's a red letter day when he gets within such a short distance of a buck.

Arrows have no brush-bucking ability and should a broadhead nip the tiniest twig on its silent mission, there is no telling where it will land.

Loosing the arrow without frightening the buck often presents quite a problem. A rifle can be maneuvered into shooting position ever so slowly and a mere pressing of the trigger sends a bullet crashing into his body. But did you ever try to draw a sixty pound bow "ever so slowly"? It's akin to doing forty push-ups. And the movement necessary to draw and release an arrow is enough to scare even the most unwary deer. So you see, the bow hunter must not only *find* a legal buck—he must also worm his way to within reasonable shooting range, find an opening in the brush through which to shoot, draw without being seen, hit the deer where it counts, and find the critter after he hits it.

But the bow and arrow boys insist that's what they like about their sport, plus the blazing autumn foliage, the hazy October weather, murmuring woodland streams and the rustle of arrows in the quiver. Come to think of it, that *doesn't* sound bad.

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Commonwealth of Pennsylvania

JOHN S. FINE, GOVERNOR

★

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★

Cover Kodachrome

by

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## *Editorial*

In addition to Columbus Day, Pennsylvanians are reminded of two other noteworthy observances occurring during the month of October—Pennsylvania Week, which is held from the 13th to the 9th, and Hunt Safely Week, 19th to the 25th. The first calls attention to the Keystone State's industrial, economical, educational, scientific, historic and recreational importance. The theme "Pennsylvania Defends Freedom" expresses the rule of the Keystone State ever since the signing of the Declaration of Independence. The second reminds our hunters of the folly of disregarding the laws and rules of safe gun handling.

Perhaps it is mere coincidence that these observances follow on the heels of one another. Nevertheless they form a fitting combination, for *Pennsylvania* and *hunting* are as inseparable as Philadelphia and the Liberty Bell. Long known as the "Cradle of Wildlife Conservation" and efficient game management, Pennsylvania's hunters number approximately one million, and it is impossible to enumerate our Commonwealth's accomplishments without mention of her pre-eminence in providing outdoor recreation.

Regrettably, in spite of Pennsylvania's many other achievements she *cannot* claim the distinction of leading the nation in hunting safety. During the past hunting season twenty-five people were killed and 386 were injured in what are commonly termed hunting-shooting "accidents."

It is inconceivable that our hunters and the public in general should accept these tragedies as the natural accompaniment of an increased number of hunters, and yet from their apathetic attitude such would seem to be the case. At least little outstanding effort has been made to halt this appalling waste of life and limb.

The irony of the situation is apparent when we realize that hunting mishaps could be practically eliminated by the application of a little more care, good judgement and unselfishness. By being sure of your target before you shoot, by handling all guns as though they were loaded, by refraining from pointing your gun in the direction of anyone, by choosing a suitable backstop, by keeping your gun "on safe" and the hammer down until you are ready to shoot, by observing these and a few other simple precautions you can take all the danger out of hunting and shooting.

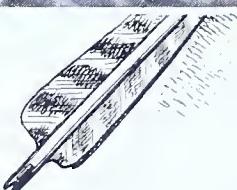
Let us therefore resolve to add another honor to Pennsylvania's impressive list. Starting this year let us make the Keystone State the *safest* state in which to hunt.

Always remember that hunting safety depends upon YOU.



# Bow Hunting

By Thomas A. Forbes



*It takes large doses of both luck and skill to bag a buck with the bow and arrow, but the hunter who learns the fundamentals of this specialized sport need not bank on Luck alone.*

THE historical records of the first attempts to establish permanent settlements on the Eastern coast of the United States recounts the death by starvation, disease and Indian attacks of more than eighty percent of the Virginia colonists. In 1587 Raleigh established a colony of one hundred fifty persons on Roanoke Island; three years later no trace of the colonists could be found and their tragic fate is still a mystery. In the Jamestown settlement nine out of

every ten of the colonists died during the winter of 1609-10.

These early tragedies were the direct result of the failure of man to adjust himself to a new environment. All the necessities for maintaining life were abundant on the Eastern seaboard. Deer, turkeys, and small game were plentiful and at first, at least, the Indian maintained friendly relations with the colonists. But the white man's hunting methods were inadequate. By stealth, the art of con-

lment and a thorough knowledge of the habits of the game he sought, the Indian survived. The white settler, in spite of his superior weapons, perished.

In Pennsylvania it is reasonable to believe that the present deer concentration equals if it does not exceed the number of deer existing in a like area in the Virginia Colony at the time of the first settlements. With the improvement in firearms since colonial days, more and more emphasis has been placed on skill in the use of the weapon and the term *hunter* has degenerated to mean anyone who carries a weapon into the woods in search of game.

In recent years more and more men who kill their buck each hunting season have felt that the thrill has gone out of deer hunting for them. They do not consciously realize that through years of hunting with the rifle they have acquired a thorough knowledge of the game they seek. They have become hunters in the true sense of the word. To them the pleasure of the hunt is already over when a deer is within range of their gun.

It is to hunters of this type that we owe the appearance once again in the hunting field of the man armed with bow and arrow. Welcoming the chance to pit his knowledge of game and his skill in stalking he roams his old well known territory. He knows the bed grounds, the trails, where the deer come to drink, where, when, and on what they feed. Silently he moves through the cover, his garb inconspicuous, standing quietly for long intervals while he surveys the terrain, working up or across the wind, lightly shod so that he can move quietly. This hunter has turned back the pages of time. To him again comes the joy he experienced when he first started hunting. At last he is matching his skill against the wiley deer with the advantage usually on the deer's side and not on his. Long

ago he learned that the pleasure is in the hunt and not in the kill.

### The Weapon

A bow with a drawing weight of forty pounds and *razor sharp* broadhead arrows is an adequate combination and provides an effective weapon for killing deer, although one should use the heaviest bow he can comfortably draw. A common fallacy which has influenced a number of beginners in purchasing equipment is that an archer's standing is rated in accordance with the weight of the bow he owns. They buy bows which they can draw only by maximum effort. More accuracy will be obtained by shooting a bow which can be drawn without undue strain.

The killing power of the broadhead arrow is its cutting action which causes internal hemorrhages, cutting blood vessels as it enters the body of the deer. The archer should always seek to secure a chest shot as it not only produces bleeding but penetrates the lung cavity and causes the collapse of the lungs. Try to place your arrow at the point just back of the front leg and about one-third of the distance up from the bottom of the chest. Do not be surprised if the arrow passes entirely through the deer. A broadhead will easily cut a rib but it will probably be stopped by the shoulder bone and fail to reach a vital spot.

Deer have been killed at better than sixty yards in Pennsylvania but the average kill is made at about thirty yards. On the other hand deer have been missed at incredibly close range. A former gun hunter well acquainted with the habits of deer bought a bow with a drawing weight of fifty pounds and on the first day of the special archery season missed his deer at eight paces. In recounting the story he said that he knew nothing about a bow, and had not had any instruction or practice. Taking a seat on a log near a favorite runway he

was rewarded by having a buck walk slowly past. From his seated position he stuck the end of the lower limb of the bow in the ground in front of him, drew the arrow back to his chest and let fly; confident that he would shoot clean through the animal with his heavy bow. The broadhead struck the ground about ten feet in front of him and the deer left for parts unknown. Still determined to bring down a deer with his bow the archer is practicing this summer to acquire the ability to deliver an arrow to the mark. To practice he bought a thirty pound bow with which he can shoot for an hour or two without tiring or injuring the fingers of his shooting hand.

The sole advantage in using a heavy hunting bow is its flat cast or trajectory over short distances. If the hunter has a clear line of vision to his quarry he can be reasonably certain of the broadhead flying true to the mark along the line of sight. A broadhead shot from a lighter bow under similar circumstances will rise and fall on its way to the target and may be deflected from its line of flight by branches or twigs which are above the line of vision.

### Clothing

The deer hunter in Pennsylvania during the month of December is customarily garbed in heavy woolen garments and shod with suitable foot wear designed to keep his feet warm and dry. His garments including his cap are predominantly red or bright orange in color. This is a recognized safety precaution where a long range weapon is carried by the hunter and large numbers of persons are moving about in the deer country.

Clothing suitable for December is not required or desirable during the special archery season in the month of October. In the northern tier counties where we have our largest concentration of deer the early mornings are cool, but by midmorning the

warm rays of the sun send the temperature climbing and a light w<sup>o</sup> shirt, khaki trousers, and light wei<sup>l</sup> foot wear with the addition of can<sup>g</sup> leggings to protect the lower lin<sup>e</sup> from the morning dew is adequate<sup>g</sup> garb for the season of the year. In addition, a light pullover sweater<sup>g</sup> may be worn in the early morn<sup>g</sup> and a rain coat made of one of the light plastics which can be folded into a small compact package and carried in a pocket are desirable. Since the bow is a short range weapon and the number of archers small compared to the number of gun hunters the wearing of red colored garments as a safety precaution must be weighed against dress which is inconspicuous and blends into the surrounding background.

### Hunting

With his knowledge of game habits and his skill in stalking, the Indian was able to secure his supply of meat with the bow. Stalking means more than the ability to walk silently. It embodies the art of concealment, see without being seen, to take advantage of cover in moving through a territory so that the hunter does not announce his coming; and most important the knowledge to break through the defensive protection with which the deer is naturally endowed.

The deer depends on three of his five senses for protection; sight, smell and hearing, and not necessarily in the order named. Frequently it is stated that a deer has poor eyesight. I discount that statement knowing that they feed mostly at night and can pick their way at full speed through thick cover and over uneven ground without apparent trouble. The deer's sense of hearing is acute, probably far better than man's due in large measure to the shape and size of the outer ear. Weighing the value to the deer of sight and hearing, scent or smell is probably the most valuable of the

er's senses. The scent of man will carried to a deer from long distances by currents of air and this factor alone makes it possible to travel through good deer territory without seeing a single deer. The hunter must pay particular attention to weather conditions when still hunting and use the prevailing conditions to help conceal his presence rather than have them announce his coming to the deer.

Taking advantage of the wind has already been mentioned in this article. It is however a thoroughly misunderstood term. If the wind is blowing a good breeze so that branches and small limbs of trees are swaying, scent is the least of the hunter's troubles. His scent is rapidly and thoroughly dissipated in the air and the deer will have to be very close to wind you. Under conditions such as these the deer will probably rely on sight to give notice of approaching danger. It is the movement of masses of air known as thermal currents on what we normally speak of as a still day which carry the man scent over long distances without dissipating it and give notice to the deer of the approaching hunter.

The movements of these thermal currents or masses of air are influenced by the topography of the country. In our mountainous sections the morning sun striking the tops of the ridges warms the surrounding air which begins to rise. Its place is taken by the colder air mass which moves up along the slopes of the ridges and the ravines from the valley to occupy the space. The deer is well aware of this natural phenomena and seeks the high ground during the daylight hours where he can make the best use of his sense of smell to warn him of approaching danger.

In the evening the direction of this flow of air is reversed. The mountain tops cool quickly and the surrounding layer of cold air being heavier than the warm air still in the valley

falls down the slopes. When you see one of our larger birds soaring gracefully near the top and parallel with the ridge you realize that the birds too take advantage of the rising currents of air moving up the slopes to maintain themselves in effortless flight.

Consequently the hunter must work his territory from high toward low ground in the morning of a sunny day. He will have a chance to approach a deer concealed in a ravine if he works down from the head. In late afternoon he will reverse his procedure and hunt up the same ravine to prevent his scent from preceding him. If the day is cloudy and overcast these masses of air are not effected by the sun and remain at rest. The hunters movements are then guided solely by the direction of the prevailing wind.

Deer are accustomed to noise in the woods. Many noises are familiar to them and they apparently feel no concern about automobiles passing on adjacent highways. I have found the bedding ground of deer in a hemlock clump growing at the intersection of two well traveled forest roads not more than twenty feet from the center of either road. One day having fished a section of a favorite trout stream I stepped up on a small island in the middle of the stream. The island was about the size of an average living room. The island was covered with a rank growth of grass about eighteen inches high. As I stepped out of the water I bounced a deer at my feet. Had I stayed in the water while crossing the stream the deer would probably not have moved from its place of concealment. The stream is well fished and the deer was probably accustomed to fishermen passing close by the bed ground.

To a deer on high ground the voices of people are carried up from the valley. It is surprising how far the human voice can be heard on a sunny morning when you are stand-

ing on a high point and there are people talking down in the valley. In dry leaves squirrels make a terrific racket all out of proportion to their size and cause deer no concern, but a careless step by the hunter or any other unfamiliar sound will send the deer bounding away.

On a windy, rough day the deer must place reliance for his safety on his sight. His nose and ears are least valuable to him at this time. We must concede that the deer, like ourselves, will most readily detect movement and we must take every precaution to insure the best odds for ourselves. Move quietly and slowly. Study thoroughly all the cover within sight, not once but several times. A deer may stand motionless if he believes that you do not see him and he is almost indistinguishable from his surroundings. A flick of his tail or a movement of his ear may focus your attention on him. Suddenly his entire outline will take shape. If he is facing in your direction you will have little chance to draw your bow and shoot. At your first move he will be in full flight. Your only chance is to outstand him until he is convinced that you are harmless and turns his head away. I have closed to within thirty paces of deer and then stood quietly while they stared in my direction with their ears thrust forward. Satisfied after what to me seemed an interminable length of time they resumed feeding and apparently gave no further concern to my presence.

Take advantage of background to break up your silhouette. You are much larger than the deer you are seeking and you must take every advantage of the art of concealment. Stay off of stumps—they only advertise your presence. Break up your outline by standing with a tree to your back. If you are going to watch a run or a trail pick a location where you can observe a portion of the trail from adjacent cover or even a blind.

A damp or rainy day affords opportunity to move silently through your hunting territory. On such a day the deer is forced to rely mainly on sight for protection. Although the deer will be less easily distinguished such days provide plenty of opportunity for the archer to get within arrow shot of a buck. On such a day the archer should protect the fletching on his arrows from dampness and rain. An inexpensive hood for the quiver can be improvised from one of the plastic bags used to wrap food for storage in a deep freeze locker. Keep the broadheads in your quiver separated so that they do not rattle when you walk.

Drive hunting as practiced by the gun hunter offers little chance for the archer to bag a deer with his short range weapon. If the woods are dry and the sound produced by walking in the dry leaves makes it impossible to move quietly a drive may be the only means of getting within bow shot of a deer. The archers' drive, however, is not like the drive commonly used in the gun season. Shoot at running deer with the bow offers little chance of success. When a hunting party of archers decides that conditions in the woods are such that only a drive is feasible they use a modified method of still hunting in an attempt to get within bow shot of their quarry. Selecting an area with which they are familiar the archers divide into two or three parties, depending on their numbers and the amount of territory they wish to include in their drive. They allot a designated starting point for each group on the circumference of the boundary of the area to be driven. Syncronize their watches, and agree that for certain time intervals each group in turn will act as watchers while the remaining group or groups walk slowly toward a common meeting point selected in the center of the tract. In any one group each archer on the line is in constant touch with

archers on either side of him. The line moves slowly and covers the trail methodically, maintaining silence, for a certain interval of time; then stops and acts as watchers for a short length of time while their companions who have been standing by watch now begin to move toward the central point. If deer move out ahead of any group while the group is driving it is highly possible that the deer will slip quietly away and be frightened into running away at full speed. In this event the men who are standing on watch at the time have an excellent chance at getting a shot as a buck who is busily engaged in eluding the driving group. Move as quietly as possible. Stay close enough together to cover the spots where deer may stay quietly hiding and when it is your time to watch conceal yourself with care to ensure the best opportunity for a shot at a deer that may be moved to bow shot by your friends.

Last year in Pennsylvania during the special archery season thirty-two

bucks were reported killed. Five thousand four hundred and forty-two special archery licenses were issued. Published reports from data received by the Pennsylvania Game Commission indicate that an average of nine hours of hunting was required to sight a legal buck. The average hunter spent four days in search of deer. If you have not improved your hunting technique since last season the chances appear to be about 170 to 1 against your killing a deer. However if you were a novice last year there is no reason why you should not let nature and the elements work on your side this season. You know the territory now and the deer are there. This article will not make you a skilled woodsman but the principles laid down herein should improve your chances of getting within bow range of a buck and the balance will depend on how well you have learned to handle a bow since last season. Good luck.

. . . *The End.*

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## SPECIAL ARCHERY SEASON FOR DEER—REQUIREMENTS

### CONDITIONS WHEN REQUIRED

A Resident or Nonresident Hunting License and a Special Archery License or Archery Preserve Permit are required by *each person* (no exceptions) to hunt for male deer with two or more points to one antler with bow and arrow during the state-wide bow and arrow season October 13th to October 25th, 1952, both dates inclusive. The Special Archery License or Archery Preserve Permit also entitles the holder thereof to hunt for and take game of any kind with bow and arrow during the lawful open season on the two Special Archery Preserves located in Forest and Sullivan Counties.

### CONDITIONS WHEN NOT REQUIRED

*Except as Above Defined*, bow and arrow hunters require only a current Resident or Nonresident Hunting License to hunt for small game, bear or deer, during the lawful open season for such species of game. However, before anyone may hunt for antlerless deer during any special season declared by the Pennsylvania Game Commission, such person must also purchase an Antlerless Deer License at a fee of \$1.15, unless permitted by law to hunt without a license on land resided upon or immediately adjacent thereto with the written permission of the owner or occupant.

# Outdoor Reveries

By John H. Day

## *Midnight Tragedy*

SOMEBODY hereabouts owns a coon dog with a remarkable baritone voice. In company with other hounds of lesser vocal attainment this four-legged nightingale stages a concert every so often, using the wooded hillside right across the valley from our open bedroom windows as his sounding board. The hunters who course these dogs must sleep all day, for they never show up until the small hours of the morning.

Every man who loves the outdoors has a great fondness for the belling of a hard running hound. Under the right conditions it is quite enjoyable to lean back against a broad tree trunk and listen to the good night music of a pack giving tongue in full voice on a red hot trail. It is quite a different story to be shocked full awake at 3 a. m. by a banshee howl that shudders up and down the valley for many miles.

Whoever owns this dog should certainly call him Bing, for in my book he is far and away the champion canine crooner of the countryside. His singing fascinated us the first



night he came on stage on the hillside across the creek. Since then we have lost many hours of good slumber while he broadcasted bulletins of the chase. He is a pure prima donna, talented, temperamental, and very, very loud.

Another hound, perhaps a member of this musical coterie, played a heart-wrenching role in a recent midnight tragedy in the valley. We had heard the dogs during the night, but aside from the fact that one voice seemed to come from a fixed location, noted nothing unusual. During the busy daylight hours this dog probably cried often, but our ears were not attuned.

The next night we heard the single voice again. We mistakenly thought the hound was baying a treed quarr or perhaps a fox run to earth. All night long this voice cried at intervals and we remarked at the persistence of the hunter. Another day went by and again during the night that

gnant cry came at times from nowhere across the valley. By this we knew that something was wrong and that a lone dog was in trouble somewhere out there in the night.

The next afternoon we made the search for this dog. The voice seemed to be coming from a point halfway up the steep hillside across the creek some few hundred yards behind the house. Acoustics in the valley are quite tricky and we were not too certain that the mournful baying was not the echoed voice of a hound tied out on the neighboring farm. We parked the car and walked down the railroad right-of-way between the hillside and the creek.

All the time that we were in the area there was not a single peep from the dog we were seeking. The farm hound bayed several times and we finally gave up and went home, convinced that we had been tricked by an echo. No sooner had we put away the car than the crying came again, definitely from a point somewhere out there below the house. We lined up the sound with some tall landmarks and established the locale for another combing of the brush-tangled hillside.

Next morning we forsook Sunday school and church in the hope of finding the trapped dog and relieving his evident agony. By a devious and none too good roadway we drove clear to the top of the far hill and established a line on our landmarks. Here we spread out some 30 yards apart and drove straight down to the creek. The going was easy and the woods so open we could not have missed the quarry. Again the trapped dog ceased calling and we were apparently defeated.

We set out for a short hike in the October sunlight along the path skirting the base of the hillside. Suddenly the cry came again, this time definitely close by and apparently across on our home side of the creek.

I plunged into the creekside tangles and finally reached the bank of the stream. I could now hear the dog whining and closed in, finally noting some commotion in the thickets across the water.

There is a shallow rip where the stream makes a wide bend at this point. I splashed through this and soon came to the poor animal, hung up in the wire fence edging a corn field not two hundred yards from our back door. A short stub of wire, extending an inch or so from a main stay near the cross wire, had pinioned the hound's left hind leg at the knee joint. In struggling to escape the dog had broken this leg in a compound fracture. The ground about was sadly scarred by his pitiful efforts to escape.

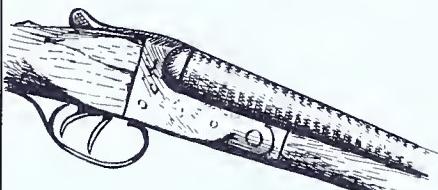
There was only one thing to do and we did it as quickly and as humanely as possible. The black and tan fellow will hunt no more across the hills with his pals. We gave him the decent burial a good hunting dog deserves. His collar carried no license, so we will never know his name. Perhaps he has gone to a happier hunting ground where there are no wire fences to halt an eager nimrod.

The day had been murky and heavy with haze, closing in at the evening hour with an intermittent drizzle from low hanging clouds which seemed to rest on the hilltop across the valley. Full darkness came early and we were glad for the lights and warmth of home. One of the main airways passes right over our house and we remarked at the low flying transports feeling their way in by instrument through the soupy weather.

There is another skyway, mapped out many years ago, heading southerly above our valley. The pilots who fly this route depend not on instruments, but on a sure instinct which holds them true on course no matter what the weather. The radio was

# HUNT SAFELY

*Beware of  
unsafe firearms*



blasting away and a big four-motor plane was roaring in overhead when we heard another hullabaloo which brought me racing to the door.

It was old familiar music, the exciting, spine-tingling gossip of a great flight of Canada geese freighting through the darkness to some favorite seaside resort, probably somewhere near the Chesapeake. The powerful birds were very low as they crossed our valley and there was much conversation between pilot and navigator, and between pilot and the two wingmen.

I could imagine that great V-shaped formation up there in the darkness, driving through rain and cloudbank, wind and midnight calm. As with every outdoorsman who hears these birds go by my spirit tugged mightily at the leash, eager to be out there on the flyways, breasting the skies enroute to high adventure. We strained to hear the last faint honking as the flight drove on out of earshot.

The word is out in the bottomlands. Any night now—perhaps tonight—the black death of the first killing frost will stalk through the thickets. These recent midnight attacks, which discouraged some dahlias

and other tender greenery, were b advance warnings; prevues of the imminent lethal blow which will sm the glory of another Autumn. Across the countryside the wild folk are battening down hatches preparation for the cold, dark da that lie ahead.

The sun moved up in a cloudy sky that heralded a perfect m October dawning. Frost patching had quilted some lowland areas, b the warming rays soon dissolved the glowing silver. Every haze-drench weed stalk shed liquid sparks of m ten color.

The countryman eased one eye o from beneath the blankets and gazed on this October enchantment. R reflected glow from a huge map flooded the room with luminous light. Not even the merest breath of breeze marred the complete quiet of this perfect morning. Somewhere below the house a songsparrow sang dreamy snatches of his Springtime melody.

As their appointed time arrived the golden maple leaves cast loose from their moorings and float silently down to join the warm mulch blanket. The marvelous cycle of the leaf had run its course. A tiny co dam closed the twig end, to prevent bleeding, and the tired leaf went peacefully to find rest among its fellows. The countryman is never closer to the Creator than when alone in some far-off grove in the awesome stillness of this annual ritual of the falling leaves.

For a few weeks in October the sun actually stays on course, rising in the east and setting in the west. The hiker finds the waning afternoon light too much in his eyes, and is glad when he can turn his back on Old Sol and watch the woods ahead of him in comfort. He reaches a belt of cut-over "slashings" and walks a sea of heady Autumn perfume kicked up from the drying penn royal crushed by his boots.

There is loneliness in October, even though the Master Painter warms the hills with flaming color. And with the loneliness are lonesome, meditative silences; broken only by the caw of a crow, the rustling of falling leaves or the far-off barking of a farm dog. There is little bird song now, although the song sparrow can still sum up a real roundelay and the Carolina wren has not lost his voice. When the frost king rides through the valley our popularity with the little wildlings hereabouts suddenly increases. They paid little attention to us all Summer, but now we have more visitors than we can handle. There's at least one daddy-long-legs in each of the door screens. All the lady beetles in the neighborhood have clustered in the framing of a cellar window. Spiders are pouring through every crevice and strange batters in the attic must be either chipmunk or deer mouse.

One of the busiest little fellows on the wayside scene these days is the chipmunk. Never satisfied that his Winter stores will see him through, he goes into high gear in October, ramming his jaws so full of seeds and nutlets that he seems to suffer from chronic mumps. Disturb him in his work and he'll vent his ire in no uncertain language, making certain meanwhile that one jump will see him to his parlor door and safety below decks.

The scientists have given this pert little busybody a name that fits him like a kid glove. They call him *Tamias*, which when translated means "the steward," and he lives up to the name perfectly. Somewhere at the end of his lengthy tunnel he has a roomy warehouse, lined with soft grasses. Here he stores his Winter supplies. Long hours of diligent labor are represented in this underground granary, but whoever saw an undernourished chipmunk?

One extra bonus which October has brought to the valley are the

morning mists. The rising sun reveals the lower fields as steaming bogs with smoky tides ebbing and flowing about the house. Sometimes the haze is so thick that familiar trees and shrubs take on the grotesque habiliments of pure witchery. Dangerous indeed is this fog to early motorists but part of October's beauty lies in these silvered dawnings.

October is a glorious month, to many the cream of the calendar. The wise soul will not take a leaf from Nature's unhurried book, and learn the healing joy of quiet contemplative repose and meditation. The year is ripe and ready to be plucked. Even now the bud of a new and perhaps fairer year is forming.

. . . *The End.*

*The American Magazine*, first magazine in America, was published in Philadelphia, February 13, 1741, by Andrew Bradford.

\* \* \*

The first newspaper to be published west of the Alleghenies was the *Pittsburgh Gazette* which made its initial appearance to the public July 29, 1786.

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The first aluminum was produced in commercial quantities in November 1888 by a Pennsylvania corporation, the Pittsburgh Reduction Company, which later developed in the Aluminum Company of America.

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The "Kentucky Rifle," powerful and accurate Colonial firearm, was designed and first made—not in Kentucky—but in Pennsylvania.

\* \* \*

The first force to reach George Washington after he assumed command at Cambridge, in 1775, was a company from York county, Pennsylvania, under Lieutenant Henry Miller, which had marched over five hundred miles.



PGC Photo By Studholme

## *Semi-Annual Report of Research Biologists To the Hunters*

Edited by Roger M. Latham

THE reports of wildlife research studies are usually written in a technical language difficult for the average hunter to understand. Also, the distribution of these reports is normally restricted to the profession—the wildlife managers and technicians who can use the information to produce more wildlife for recreation. However, many sportsmen are vitally interested in the progress and findings of the various biological investigations being conducted in their home state, and perhaps it should be an obligation of the game and fish departments to keep its hunters and fishermen well informed.

To fulfill this need and obligation, it is planned to have each research biologist summarize his activities and accomplishments semi-annually and present this information to the sportsmen through the GAME NEWS. This is the second of these reports to the hunters of Pennsylvania.

### COTTONTAIL RABBIT MANAGEMENT STUDY (Southwest Sector)

Glen L. Bowers

The popularity of the cottontail rabbit as a game animal in Pennsylvania is indisputed. But the question is often asked—how can we produce

more rabbits? In order to gain information on this subject for its own use and for others, the Game Commission inaugurated a series of management studies. These studies have nearly reached completion, and there is considerable information ready for sportsmen who wish to grow more rabbits. Abandoned farm land wa-

ed in these studies because it was more readily available than actively cultivated land for game management purposes. However, some of the practices developed on these lands could be applicable and productive in more heavily farmed areas as well. To improve living conditions for cottontails, food plots and cover improvement areas were established. On these abandoned lands, large quantities of lime and liberal applications of fertilizer were necessary to fit the soil for the desired grasses, clovers and other legumes. These soils were generally quite sour and lacked organic matter, and in the initial reclaiming operation it was not considered practical to attempt to establish alfalfa, ladino clover, and other plants which demand the better soils. Alsike and red clover grew well in the two years following seeding, but good stands could not be prolonged; sweet clover was easily established and reseeded readily. Orchard grass, smooth bromegrass, and timothy were quickly established, but care had to be exercised in seeding these grasses lightly to avoid severe competition with the more desired legumes.

Bluegrass and white clover have volunteered after liberal use of lime and fertilizer. These desired plants are still present from the old farming days on areas where the soil fertility remained at higher levels. These areas should be managed by mowing, fertilizing and mowing. Rabbits preferred the more tender clovers—white, alsike and ladino; young, tender growth of red and other clovers was also readily eaten, but after the stems became "woody" the utilization decreased. Mowing is important in maintaining the succulent growth desired by cottontails.

In some places it was unnecessary to improve cover immediately adjacent to food areas but usually some cover improvement was not only desir-

able but imperative if the food was to be of any value. Cover improvement was realized in two ways—by cutting existing vegetation or by planting seedlings. While numerous seedlings have been planted, they have made insufficient growth on the study area to contribute to the present game populations. Important contributions to rabbit welfare were made by edge cuttings, cutting and bending pines, releasing grape and other vines, and general cutting of old field areas reverting to brush.

Density of the trees and brush, the kinds of plants, the presence of vines, and the topographic location should be considered when determining how an area should be treated for cover improvement. Dense stands, or stands with many vines, may be treated by the cut and fall method; less dense areas of deciduous species should be cut and piled or windrowed. The cut and bend method was best used on pines which continued to grow in a reclining position and furnished excellent cover. Recent observations indicate that for maximum benefit to rabbits most deciduous areas will need recutting or retreatment every four or five years; our experiments showed that using the chemical 2, 4, 5-T on the less desirable species may aid in prolonging the useful period. Ammate may be used advantageously in killing larger trees to release more desirable trees or grapevines.

The provision of preferred foods and the improvement of cover by the above methods resulted in an increased cottontail population on the study area. The rabbit numbers increased from an estimated 88 in the fall of 1948 to 288 in the fall of 1951. The shortage of rabbits claimed by many hunters during the 1951 season was certainly disproved by the cottontails trapped after the season and the many rabbits observed during the winter and spring months. More of the rabbit crop should be harvested,

and more attention should be devoted to the improvement of living conditions for cottontails.

In recent years it has become common for many clubs and organizations to release rabbits for "restocking" purposes. *While this and other studies have shown that there was ample breeding stock present after the open season, and therefore no need for this practice, it still continues.* In order to determine what contribution released cottontails may make to the general population, a representative sample of rabbits handled in the trapping and transfer program of "home-grown" bunnies was sexed, tagged and marked for field identification.

This work was carried on in January and February, and while more females were taken early in the season this trend was later reversed and the total of 1054 cottontails was sexed as 529 males and 525 females. Releases were made using 6 to 24 rabbits at distances of from one-half mile to 35 miles from the areas trapped.

*Return of tags from road killed rabbits and observation of marked individuals has shown a wide dispersal following release.* One rabbit was killed on a highway more than three miles from the release site and another returned to the area where it has been trapped and was killed on a road there. Observations around the release sites indicated few of the animals in the vicinity; this was true even when releases were made in some of the better rabbit habitat.

*Any hunter killing an ear tagged rabbit should report without fail the tag number and give an accurate statement as to the location it was bagged.*

#### COTTONTAIL RABBIT MANAGEMENT STUDY

(Northeast sector)

*Wilmer C. Richter*

The first article in this series presented some of the reasons for the

investigation, the procedure in handling trapped rabbits, and some of the specific information available from records and observations.

Besides the well rounded plan designed to furnish a maximum amount of useful information, another an equally important plan of habitat development was included to improve the carrying capacity of the abandoned land.

Approximately thirty acres of developmental work was completed on the experimental area. Seventeen food plots of varying sizes supporting grasses and legumes were dispersed over the experimental section. Adjacent to these food plots were brush piles, sprout growth, and briars resulting from the cover improvement work. The brush piles offered escape cover for rabbits at all periods of the year and the briars and sprout growth afforded a plentiful supply of winter food. The rabbits present on the area utilized all the improvement work at various times of the year.

Despite the marked physical change of the abandoned land by the addition of desirable food and cover, no appreciable improvement was noted in the cottontail population on the experimental area. During the same period, there was no appreciable improvement in the population on the control area. Although this management work appeared to be unproductive in this scrub-oak region, further study may show that other scrub-oak areas can be managed successfully.

Since the suspension of food and cover management in 1950, marked changes have taken place on the experimental area. Most of the planted grasses and clovers have died out especially on the wetter sites, and have been replaced by goldenrod, poverty grass, cinquefoil, and other less desirable plants. Birch, blackberry, scrub oak, sassafras, aspen and other trees and shrubs have invaded the food plots.

The brush piles which once offered adequate protection from winter storms have deteriorated and the resultant sassafras, scrub oak, and birch sprout growth rapidly closed in potential brier producing sites.

Since food and cover development did not seem to encourage population increases it was decided to release some native trapped rabbits on the area to determine whether the addition of breeding stock would result in greater fall populations. This operation was planned without previous provisions for predator control. Co-incident with this release came the Rabies Control Program in which both the experimental and control areas were included for treatment. Future trapping should determine the effect of stocking and predator control of both areas.

Each winter thousands of cottontails are trapped and transferred to areas open to hunting. This winter an investigation was carried on to determine (1) movements of cottontails stocked, (2) whether liberated cottontails have a tendency to return to point of capture, (3) whether more males than females are trapped and transferred, and (4) if stocking plays a part in providing increased shooting in the fall.

To study the winter trapping and transfer program, 349 native trapped cottontails were sexed, tagged, and released in a portion of Luzerne County. Two hundred of these rabbits were females and 149 were males.

Returns have been received from five of the liberated cottontails which have succumbed.

In order to accumulate as much information as possible, co-operation is requested of all sportsmen. Should you, at anytime, find a rabbit with a tag in its ear kindly return it to an employee of the Pennsylvania Game Commission or to the Wildlife Research Division at Harrisburg.

In this way you too can help add

to the information being sought by the research biologist!

## THE WHITE-TAILED DEER STUDY

*Stanley E. Forbes*

A function of management is to perpetuate or to plan for the future. The deer herd in Pennsylvania must be managed. Any course of action should be determined from principles based on fact. The collection and analysis of these facts—range conditions, herd conditions and development, population distribution and concentrations, the extent and control of deer damage both to forest regeneration and to agricultural crops—constitute the main objective of this White-tailed Deer Study.

The survey of the present deer range and deer population distribution had to be discontinued during the past hunting season. It was postponed again this spring because of the assignment of the project personnel to Rabies Control. The remainder of the period up to July was utilized in the preparation of various reports, in working up the data collected on deer throughout the past year including the hunting season, and in the supervision of other phases currently being conducted by personnel temporarily assigned to this work.

The study of deer damage to reforestation, both natural and artificial, was completed as of June 1. The reports covering these investigations are being prepared and will be available for publication in the near future. It has been determined that severe browsing by deer can seriously retard forest regeneration even to the point of changing the forest composition. It is quite possible that this statement may not be fully understood by the average sportsman, but it must be remembered that the deer in most sections of Pennsylvania can no longer live on a diet of preferred foods; overbrowsing has eliminated

these. The deer now browse on any plant within their reach that will help to sustain life. This means a scarcity of forest reproduction and results in a condition in which the deer can not find adequate food to maintain a maximum population. A tract of timber approaching maturity and having little undergrowth can spell nothing but doom for the deer herd because of critical food shortages. Even extensive plantings (artificial reforestation) in an area of this type face defeat unless protected by fences or by other means to control the depredations of the deer. However, the cost of such measures is prohibitive if carried out on a large scale. Orchardists are not the only commercial tree growers which have troubles; the crops of nurserymen and Christmas tree growers are also suffering from the ravages of the hungry deer.

A survey of deer damage to agricultural crops is underway to determine how extensive this damage is and if there is a practical way to control it. This phase has just begun and, although field methods have been tested, there is no report available at this time on the results of the survey.

Other phases currently being carried out are the testing of existing deer repellents, and a search for newer and more effective ones to provide the farmer with a cheap but adequate means of controlling deer damage to his farm crops. For many years, the change in food habits of deer has shown a gradual but decided shift from browse to agricultural crops (grazing) in some localities. Deer can and do adapt themselves readily to survive in these times of constantly changing conditions; but at the present time, they are doing so at the expense of the farmer.

Nutritional requirements necessary for good antler growth are being studied also. If the proper ingredients can be identified and supplied arti-

ficially through feeding, it may be possible to compensate for the lack of adequate food and to assist Nature in developing those much desired trophies.

An analysis of the data collected from deer killed during the past hunting season revealed some interesting facts. Some information was obtained from fifty-two of the sixty-seven counties. Records of examination were established and filed for 1533 deer (1131 males, 402 females) from these counties. Figure 1 shows the per cent of the total kill represented by each age class for both males and females. It can be seen that the kill of the females is fairly evenly divided among the first three age classes, and that the kill decreases gradually as the age increases. The picture presented by the male kill is considerably different in that the  $1\frac{1}{2}$  and  $2\frac{1}{2}$  year age-groups furnish the bulk of the kill (63%). The males shown in the fawn class were of course taken during the antlerless season, but few of the male adults were taken during that period. The per cent of the buck kill in each of the age classes beyond  $2\frac{1}{2}$  years shows a sharp drop, and specimens above  $5\frac{1}{2}$  years were very scarce. Many females in the older age groups were taken. Another interesting fact that became apparent when these data were compiled was that the male-female ratio of fawns killed during the antlerless days was approximately the same as the male-female ratio of embryos found in the examinations of adult females killed on the highways during the previous spring. These ratios were 1.25 males: 1 female in embryo examinations and 1.07 bucks: 1 doe during the hunting season.

A look at the average weights (actual hog-dressed weights) reveals that the weight averages increase gradually for the females, more sharply for the males, until the peak of weight development is reached at four and

e-half years. From that age the cline progresses at a gradual rate for both sexes.

The antler development for the males appeared to reach its peak at  $2\frac{1}{2}$  years of age. An analysis of the data showed that 76 per cent of the yearlings killed had a total of from 3-6 antler points. Eighty-five per cent of the  $2\frac{1}{2}$  year olds and 87 per cent of the  $3\frac{1}{2}$  year olds had from 4-8 points, 71 per cent of the  $\frac{1}{2}$  year olds had from 6-10 points, and 66 per cent of the  $5\frac{1}{2}$  year olds had from 8-10 antler points. Although the number of yearling deer having either three or six points were equal, the greatest number of deer killed in each age class from  $2\frac{1}{2}$  to  $\frac{1}{2}$  years had a total of eight points. The maximum number of points on any set of antlers in the yearling group was 10, in the  $2\frac{1}{2}$  year group was 13, in the  $3\frac{1}{2}$  year group was 14, in the  $4\frac{1}{2}$  year group was 15, and in the  $5\frac{1}{2}$  year group was 19. Beyond  $\frac{1}{2}$  years, the antlers showed a tendency toward a decline in the total number of points and toward irregular growth as the age of the animal increased. Management calling for a

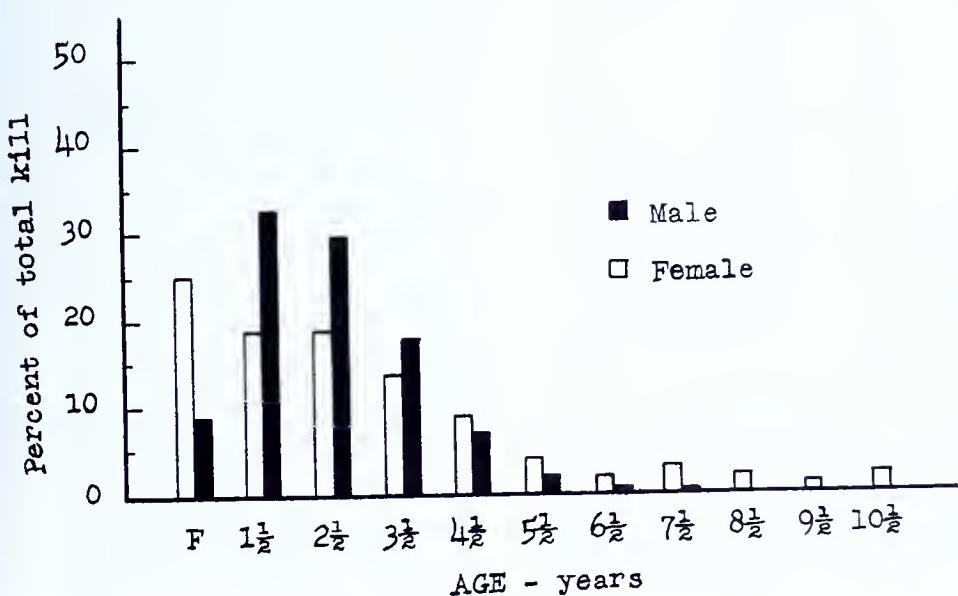
short rotation (life cycle) of bucks can and will produce an abundance of legal deer with desirable antlers under good food conditions.

The premature shedding of antlers was common to all age classes and particularly to the traditional deer counties, i. e., those of the beech-birch-maple forests of north central Pennsylvania. An abundance of specimens with shed antlers were found, with the greatest number being from McKean, Potter, Warren, Elk, and Cameron counties in that order. It is in these counties that the deer food problem is most acute.

An examination of the records collected during the 1951 prefawning period disclosed that only 63 per cent of the females were bred. Of these, 42 per cent were carrying single fawns, 55 per cent were carrying twin fawns, and 3 per cent were bearing triplets. It is normal for females older than yearlings to produce twins.

Winter losses due to starvation totalled 4418 deer in the north central counties with the reports as follows: Potter 2400, McKean 1200, Cameron 400 (including one elk), Clearfield 185, Clinton 102, Elk 55.

Table 1. Percent of total kill by sex and age of deer killed during legal open season, 1951.



Lycoming 40, Tioga 30, Union 6, and Centre 1. This loss is unnecessary, and it is hoped that proper management (and this includes antlerless seasons) will eliminate this blot on the record of conservation in Pennsylvania.

Monthly reports on the number of deer killed (excluding open season) within each district in the state during 1951 show that there were 6353 deer killed, but 22 of the 150 districts had incomplete figures. This total includes 2077 killed for crop damage, 82 killed by dogs, 3332 killed on the highways, and 862 which died due to miscellaneous causes. Crop damage kills were highest in District No. 1, Potter County; District No. 1, Forest County; and in District No. 4, Centre County in that order. The kills on the highway were highest in District No. 2, Potter County; District No. 3, Lycoming County; and District No. 1, Cameron County in that order. Total from Cameron County was incomplete, and it is the opinion of this writer that this county would have had the greatest number killed on the highway if the records had been complete. The greatest number of deer killed outside the legal open season were killed in November, the least number were killed in February (exclusive of winter losses).

The sources for the collection of data on herd conditions are the research personnel of the Commission, District Game Protectors, and the sportsmen of the state. This is a year round operation, and it is hoped that this year more sportsmen will take advantage of this opportunity to improve their sport and will submit a jaw from their deer and the special report as requested. Urge your fellow sportsmen to do likewise. In addition, anytime during the year that you are able to make interesting and informative observations of deer in your locality, it would be greatly appreciated if you would submit these

to the Project Leader, c/o the Wildlife Research Division, Pennsylvania Game Commission, Harrisburg.

## WILD TURKEY STUDY

*Harvey A. Roberts*

Since 1933, when the Pennsylvania Game Commission first started to propagate wild turkeys, the program has grown and expanded to a present day output of between five and six thousand birds per year. In view of this fact, a research project was begun on March 1, 1952, to determine whether or not artificial breeding had any application to wild turkey production. Recent experiments at several of the nation's leading agricultural colleges have clearly indicated that artificial insemination, as a technique in domestic turkey production, offers definite advantages over natural mating; and it was with these advantages in mind—increased egg fertility, the need for fewer breeding males, and greater selectivity—that this research was inaugurated.

During the course of catching turkeys at the Wild Turkey Farm for spring liberation, 60 hens were chosen for the experiment. These turkeys were divided into two groups of 30 birds each, given medication for the expulsion of any intestinal parasites they might have harboured, and placed in separate enclosures. Once in their respective pens they were immediately placed on a high protein ration to insure maximum egg production.

Flock No. 1 was designated as the experimental group, or the birds to be artificially bred; Flock No. 2 was chosen as the control group, or the birds to be naturally mated. In this manner the results obtained from the experimental flock could be compared with the egg fertility and production of the naturally mated flock. Upon noting that the hens were ready to mate, three toms were added to the control group, and natural mating followed shortly thereafter. Arti-

ial insemination of the experimental birds was begun with the appearance of the first few eggs in the nest boxes.

The technique used to obtain the semen from the toms was similar in any respects to that employed at the hatcheries for stripping milt from hens. By exerting a slight pressure on both sides of the male reproductive organ with the thumb and forefinger, a flow of semen was induced. The fresh, undiluted ejaculate was placed in a hypodermic syringe and a dosage of 1/40 ml was injected into each hen via the oviduct. This injection was given once a week for three consecutive weeks, followed by a final insemination after a lapse of two weeks. The average volume of semen obtained from the males was approximately 0.2 ml; however, quantities approaching 0.4 ml were produced by a few males. Response to more than one ejaculation a week was not too favorable; however small volumes of semen could be obtained daily.

Eggs were collected daily and incubation started at one-week intervals. The experiment was terminated when the birds had finished laying what approximated their first clutch of eggs. During this five week period, the control group produced 296 eggs, as compared to 213 eggs for the experimental group. Apparently the handling required for the four inseminations had a definite bearing on the number of eggs produced by these wild birds. On the other hand, egg fertility for the experimental turkeys was 83.3%, while fertility for the control hens was only 42.8%. Unfortunately an outbreak of blackhead (*Histomoniasis*) and the subsequent treatment with preventive medicine was largely responsible for this low rate of fertility in the control flock.

On the basis of this experiment it has been found that artificial insemination could definitely be used as a technique in the propagation of wild turkeys, particularly when em-

ployed as a safety measure. If fertility should drop off, due to some accident or fault of management, a single insemination of naturally mated birds would prove advantageous. Also for selective breeding, a few high quality toms could service a larger number of hens and produce offspring with the characteristics desired. In this manner, the stock at the Wild Turkey Farm could be improved or altered quickly and easily.

## WOODCOCK MANAGEMENT STUDY

*Stephen A. Liscinsky*

The woodcock management study was interrupted by an assignment to the Rabies Control Program. Consequently, the leader was absent at the time when the woodcock returned from their wintering grounds in the south. This delay eliminated one very important phase of the study; namely, the spring census.

The primary purposes of the project are (a) to determine the value of various management practices, with particular reference to the manipulation and improvement of environment, upon formerly productive woodcock covers; (b) to determine the seasonal abundance, movements, distribution, and cover preferences of woodcock; and (c) to study the importance of hunting pressure and predation as factors limiting woodcock numbers. It should be remembered that the life of most good woodcock coverts is limited to 15 or 20 years, and that, unless steps are taken to maintain such young growth, the site may become less and less attractive to woodcock. Improvement of "worn-out" coverts ordinarily involves the practice of thinning over-mature and over-dense woody growth. Experiments to determine the most economical and feasible methods of thinning are being carried out. The controlled use of livestock, cutting tools, fire, and chemical sprays are a

few of the most promising methods. A non-environmental improvement experiment will be the establishment of seed-stock refuges on sanctuaries. Soil fertility will also be taken into consideration.

Several of the above-mentioned experiments have been started since the resumption of the study. A brief account of the progress of each is given below.

One experiment which promises to be beneficial to woodcock coverts is the controlled use of livestock. With the cooperation of a farmer in the Bald Eagle Valley (the study district), a 16 acre tract was allocated to a grazing test. In June, this land-owner confined 8 head of Hereford steers to the enclosed area. The area chosen is typical of many bottomland coverts which have grown so thick as to preclude this use of woodcock, except perhaps occasionally during the molting season. By summer's end the vegetation becomes an almost impenetrable "jungle" of brambles and weeds interspersed with patches of alder, willow, crabapple and hawthorn. It is hoped that the grazing and stamping effect of the cattle will regulate this vegetative growth and promote a more desirable type of woodcock habitat.

Another cover-controlling experiment, initiated at the same time, was the use of various chemical sprays. In this instance the emphasis was placed on controlling one plant in particular; namely, Virgin's Bower. This vine, in combination with others, by mid-summer creates an entanglement which is easier walked over than through. Since there are extensive areas of these entanglements, and since woodcock rarely use them, it would be desirable to convert a large portion of them into low herbaceous openings or into young stands of alder and silky dogwood. Nine plots, one-hundredth acre in size, were selected and sprayed with various concentrations of 2,4-D. This

experiment will be duplicated at various stages of growth, and other chemicals will be investigated to determine the best method of controlling this vegetative tangle.

Several other experiments, not directly in the line of habitat improvement, but rather necessary other phases of the study, have been initiated. Banding woodcock is an important part of the project. Trapping male birds on the singing ground during the mating season, and capturing young broods with the aid of a well trained bird dog, are two methods proved successful by other investigators. The writer was unable to utilize these methods due to the re-assignment mentioned previously.

Experiments being carried out the present time involve methods for trapping woodcock during the summer and fall season. Using modified quail and shorebird traps, 12 woodcocks, 7 ruffed grouse (immature), rabbit and 7 turtles have been captured to date. Further investigation will be necessary to perfect the trap and trapping technique. The scarce and wide distribution of woodcock add more uphill work to an already difficult trapping problem. Nevertheless, the evidence to date proves that woodcock can be trapped in this manner at this season.

Soil sampling and earthworm counting is another phase of the study which has been undertaken. An analysis of the 22 soil samples and earthworm counts, taken thus far, have revealed no definite correlation between the soil acidity (or alkalinity) and the number of earthworms present in the soil. This examination, with modifications, will be continued.

A study of woodcock cover preferences during the late spring season revealed a few interesting facts. There was a tendency on the part of the woodcocks to select moist depressions in the terrain. Such areas were commonly used as feeding areas. The plants which occurred with greater

frequency on these sites were moisture-loving species. These included such woody species as willow, silky dogwood and alder, and such non-woody species as grasses, sedges, ferns, and jewelweed.

## WILDLIFE FOOD DEVELOPMENT SURVEY

C. R. Studholme

In past years the funds and efforts of many wildlife agencies have been largely expended in stocking unproductive coverts with various game species. This was done in an attempt to furnish continued or additional game for the ever-increasing army of hunters. While these activities have led to real accomplishments in the mechanics of propagation, and to improved strains of stock, it has become increasingly apparent that stocking is not the complete answer to the problem of enlarging game populations in the field. Repeated attempts to establish certain species or to increase the numbers of resident species in some coverts have met with continued failure. Many reasons, including predator activity, illegal shooting, inferior stock, insufficient numbers stocked, and adverse weather, were advanced for this lack of success. Large amounts of money were expended in attempts to control these factors, and still the results of liberation were disappointing.

Relatively recently it has been realized that the basic factors of cover and food are vital forces in determining game populations. Without adequate supplies of both, no species can exist, even though predator activity is reduced, illegal shooting controlled, and improved stocks liberated in large numbers.

Adopting this line of sensible reasoning, The Pennsylvania Game Commission has expanded its program of improving cover and food conditions for game on a statewide basis. This effort embraces two million acres of land, part of which is

owned by the Commission, and part of which is being developed under cooperative agreements with the various owners.

This development program has reached truly great proportions, and some results are being realized. Much of the present work is of an exploratory nature; and, as might be expected in a new program of this size, the methods and materials employed are as diverse as the number of persons concerned.

It has been decided that a comprehensive survey of the program is in order; and the preliminary groundwork for such a study has been completed. It is planned to examine and compare methods and results, as well as materials employed, in all sections of the Commonwealth. Those found most effective will be more widely utilized. Because of the magnitude of the program, the present survey will be confined as far as possible to a study of the food development aspect, with particular attention centered on the planted foodstrips.

Many problems are presented by a study of this nature. The success of any specific planting, for instance, may depend on such variables as soils, weather, planting time or methods, seeds or stock planted, or on variations or combinations of these and/or other factors.

The real value of a wildlife planting depends upon its utilization by wildlife. Utilization itself may vary from season to season, and may be the direct result of the planting as, for example, deer feeding on clover in a food plot, or an indirect result such as wild turkeys feeding on the grasshoppers in the planting. Availability and palatability of the foods to the various species of wildlife in the vicinity are, of course, important factors affecting the utilization, hence the value, of any planting.

These are but a few samples of the variables which must be examined and considered in the contemplated

survey; but they should suffice to indicate that there is ample justification for such a study, and that the possibility of gaining a great deal of worthwhile information is undoubtedly present.

The survey will be directed at the methods and materials being utilized in the development of the program, and not at the personnel responsible for its progress. No personal credit or

discredit is contemplated. The study is being undertaken to determine which of the various combinations of materials and methods now in use results in the greatest benefit to wildlife, with the hope that these methods and materials may be more widely employed, and may result in an increased supply of game for the hunters.

. . . The End.

## *Soy Beans -- Keep Off!*

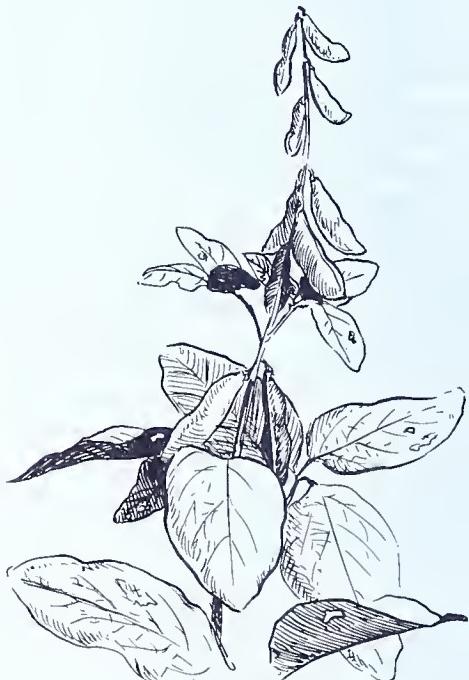
By R. W. Trexler\*

FOR YEARS the Game Commission has made every effort to establish a better relationship between the hunter and the landowner by emphasizing the fact that hunters should stay out of unharvested fields of corn, wheat, etc. In many cases the results of this attempted hunter education plan have been far from gratifying. Note the way gunners trudge across field after field of winter wheat.

Since World War II, there has been quite a demand for soy beans. This particular bean has been widely used in science and medicine, and the farmer, in order to aid research and capitalize on this new wonder crop, has curtailed his ordinary grain growing practices. The market has been encouraging and soy beans have proven to be a real money crop.

Unfortunately, I have spoken with numerous farmers who are very much perturbed about hunters tramping through acres of soy beans, flattening the stalks and loosening the beans from the pods. When confronting the farmer the farmer often learns to his dismay that the man thought he was in a field of weeds.

Most certainly we should all know what bean stalks look like, and,



should easily recognize the pods filled with beans. Because soy beans are slow to mature and are usually harvested in late October or November, they are particularly vulnerable to a hunter's boots. Let's make an effort to recognize this valuable crop.

\*Farm-Game Leader, SE Division

**3-In-1**

AVOCA, Luzerne Co.—Beavers had been causing damage in an area in his District and the residents requested that some of the animals be removed. I set several live traps but very little success crowned my efforts for some time. No beavers had been taken. One day, however, I received a pleasant surprise. Instead of one beaver the trap contained three—a mother and two young. District Game Protector Stephen A. Kish, Avoca.

**Eagles On the Increase**

EAST STROUDSBURG, Monroe Co.—Bald eagles have again returned to this District and are frequently seen along the Delaware River in the Valpack Bend area. These stately birds are the delight of many tourists who travel miles to watch their antics. District Game Protector John H. Doebling, East Stroudsburg.

**What You Doin' Here?**

ELYSBURG, Northumberland Co.—Have had several reports of persons seeing a bear along U. S. Route 11 between Danville and Northumberland. It is the same bear as it is always seen about the same place. I don't know what a bear is doing in that locality unless he is just a wanderer. This is the second report of a bear in Northumberland County. Last year we had one near Watsontown. District Game Protector Clyde E. Lauthach, Elysbury.

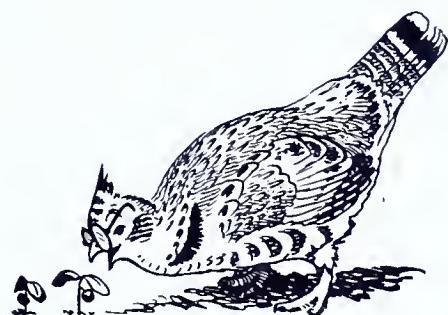
**Catbird Comes to the Rescue**

MONTROSE, Susquehanna Co.—Recently "Puffy" Beck related an incident that he had observed while fishing one evening on Ely Lake.

He stated, "Mark Lake and I were fishing down along the shore from a boat when we heard a commotion in a berry bush along shore. Wanting to see exactly what was going on, we moved in close and saw a mink hanging onto a duck's wing and a catbird attacking the mink. The duck was making quite a fuss and the catbird was making passes at the mink, with the result that the mink was finally defeated and the duck got back in the water. The mink then ran back and forth along shore until we chased it." District Game Protector James W. Clouser, Montrose.

**Near-sighted Grouse**

WILKES-BARRE, Luzerne Co.—Last hunting season a Deputy was successful in bagging a very plump grouse and upon examining it found that it had about one hundred teaberry plus a large glass marble, also somewhat red in color, in its crop. District Game Protector John C. Behel, Wilkes-Barre.





### Ground Liver for Groundhog

BELLEVONTE, Centre Co.—Workers at the Bellefonte Fish Hatchery tell me that a woodchuck daily visits the filled buckets of ground up fish and liver used for feeding the fish in the rearing ponds.

The buckets of feed are delivered to the ponds by a truck driver. Between the time of delivery and the time the feeder reaches the different ponds, Mr. Woodchuck appears. He places his front feet on the side of the 5 gallon cans, and standing on his back feet, proceeds to help himself. District Game Protector Charles M. Laird, Milesburg.

### An Ounce of Prevention

ALTOONA, Blair Co.—Last summer two farmers on R. D. 2, Altoona were losing two or three chickens from their barn every night. After looking the building over, we found that foxes, raccoons, weasels, skunks, and opossums were out because the chickens were in the upstairs of the structure. The only outside opening to the pen was a window some twenty feet above the ground.

Two pole trap sets were erected about fifty yards from the building in which the chickens were kept. At

5 o'clock the next morning the Dutch had part of their trouble in one of the traps. A large great-horned owl was their culprit.

In just one year, eight great-horned owls and one sharp-shinned hawk have been caught in these same two traps. District Game Protector Dean M. Crooks, Bellwood.

### Scram !!

ARGENTINE, Butler Co.—One evening while riding along the highway near Argentine, Butler County, Mr. Jack Hutchinson and his wife observed a wild turkey hen with a clutch of eight little ones. Mr. Hutchinson stopped his automobile, then he and his wife walked back to make closer observation of the turkeys. The mother turkey put an end to the observations by angrily chasing Mr. Hutchinson back to the automobile. District Game Protector Woodrow L. Portzline, Slippery Rock.

### Cat Gets Ahead (But No White Meat)

UNION CITY, Erie Co.—House cats are out to get a meal any way they can and sometimes figure out unusual methods to get their prey.

A farm cooperator who is raising pheasants for the Game Commission reported that a cat was responsible for the loss of quite a few birds. The cat could not enter the holding pens but would hide in the grass outside. When a pheasant would put its head thru the poultry netting to get a bug or other morsel the cat would seize the bird's head, pull as much of the bird as possible thru the fence and make a meal of what he got.

The farmer, at first, was unable to figure out what happened to the birds. He thought it rather queer that the bodies were always found near the wire with the heads and necks missing. He sat down to watch the pen and did not have long to wait, for the cat returned to get another meal. District Game Protector Elmer D. Simpson, Union City.

### Deer Take to Corn Diet

KNOX, Clarion Co.—The deer in king advantage of the food plots this year are two albinos and two does with triplet fawns. District Game Protector Donald M. Schake, this section have certainly changed their feeding habits in the last few years. Up until three years ago our food plots on State Game Land No. 3 produced more than enough corn for our winter feeding program and the deer seldom touched the stalk. Now they start working on the corn soon as it comes up and will even eat the matured fodder right down to the ground. Among the many deer now.

### Uncommon Birds Seen In Flocks

UNION CITY, Erie Co.—Last week I saw eight pileated woodpeckers in one group. So many in evidence at one place is a rare occurrence. The birds looked full grown but must have consisted of birds hatched this spring, and their parents. District Game Protector Elmer D. Simpson, Union City.

### Help!! Deer!!

BROOKVILLE, Jefferson Co.—Farmers are complaining about too many deer. One farmer reports that he has 12 acres of corn completely destroyed by deer. Upon investiga-

tion I found that by the time the corn is ready to harvest there will be no corn there except probably a few stalks. This farmer reported that one night there were over sixty deer in his fields. District Game Protector Lester J. Haney, Brookville.

### Broadtails Doing Fine

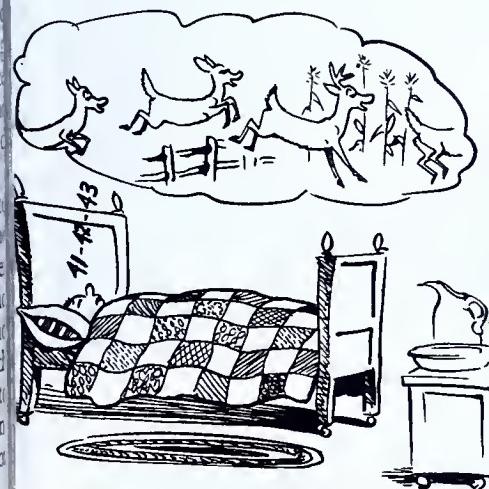
WARREN, Warren Co.—During the period between the close of the beaver season on last March 1, and the last of August a total of twenty beavers have been live trapped and moved from Morrison Run in Warren County. These twenty beavers, plus 13 beavers that I sealed that were taken by trappers on Morrison Run during the past beaver season, make a total of 33 beavers that have been trapped from this one small watershed between February 15 and August 31. District Game Protector David R. Titus, Warren.

### Plovers Reappearing

RICHLAND, Lebanon Co.—According to Deputy Miller and Paul Barry, Richland, the upland plover has again nested in Mill Creek Township, Lebanon County, after an absence of many years. Four adult and eight young birds have been seen and identified on several occasions, on Mr. Barry's farm. According to Deputy Miller's father, who hunted them as a young man, this is the first they have been seen in this section for over thirty years. District Game Protector Charles H. Shannon, Sr., Mt. Gretna.

### Grandaddy Coon

BEDFORD, Bedford Co.—H. Cyril Bingham, Bedford Burgess and Justice of the Peace, told me of a male raccoon weighing 52 pounds that a neighbor had killed in his chicken house. It was not killed in my district, but was reported to the proper district protector. District Game Protector John R. Hiller, Hopewell.





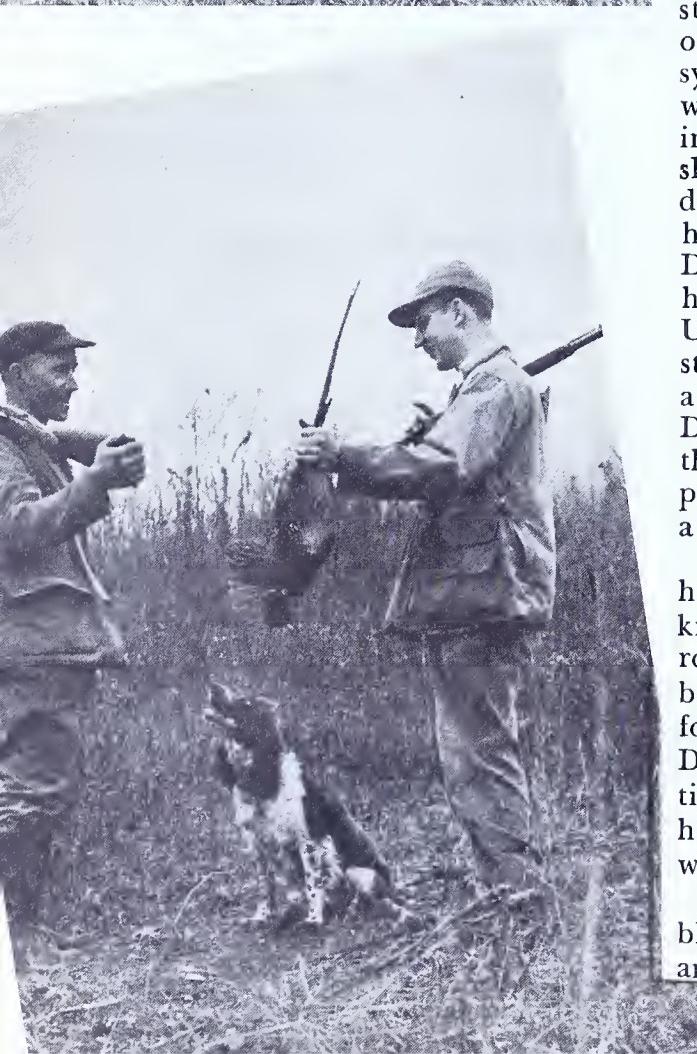
## *First Day*

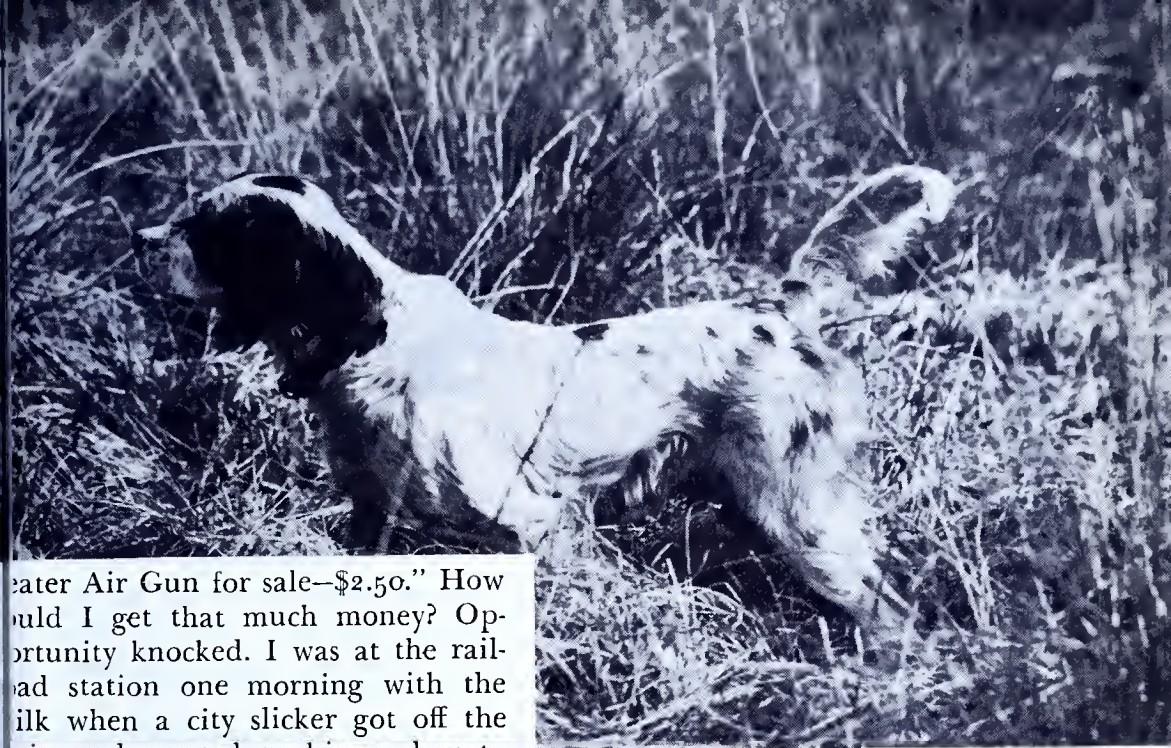
By D. Everett Moore

THE thrill of getting ready for a hunting trip is one of the great privileges of an American citizen. I started to get ready January 21, 1888, on a farm in Chester County, Pennsylvania. I thrived pretty well on a well-balanced diet of guns, traps, fishing tackle, dogs, bows and arrows, sling shots, drop shot and black powder until I was about 10 years old. I had the good fortune to have a Dad who included me in all of his hunting, fishing or trapping trips. Using a piece of board and a broomstick he made my first gun. It was a honey! He took me along the "First Day." I carried my new weapon. Next thing was a sling shot and what a proud hunter I was when I knocked a pigeon off the corn crib roof.

Then imagine my luck. One of our hired men, an Englishman, who knew all about making bows and arrows, made me a high-grade hickory bow and cedar arrows. I practiced for weeks getting ready for the "First Day." Dad showed me a rabbit sitting in our orchard and I pinned him fast with an arrow. What a bow! What a thrill!

About the time that the Maine was blown up in Havana Harbor I saw an ad in the Farm Journal, "Re-





Greater Air Gun for sale-\$2.50." How could I get that much money? Opportunity knocked. I was at the railroad station one morning with the mail when a city slicker got off the train and wanted to hire a boy to sell evening papers. I took the job and soon had the air rifle. The amazed thing wouldn't kill a sparrow at 20 feet, but it knocked the eye out of a barred rock rooster at 5 feet. I chopped off his head to finish the job. I carried it the "First Day"—roughest boy in Pennsylvania.

Selling papers was easy. People wanted to read about Teddy and Rough Riders. I wanted nothing but money to buy a 14 ga. silver mounted muzzle loader from a neighbor. In some way I got \$20.00 together and bought the outfit—gun, powder flask, shot pouch, leather game bag and wad cutter in time for the "First Day." I was really a dude with that outfit. Age about 14. Then more traps, more pelts, a Flobert rifle, black powder, shot, caps, and another First Day."

Next was a single breech loader pigeon gun. We really gave the pigeons a chance. Gun below waist until pigeon was in flight. One shot at 30 yards. No boundary. If you passed your bird you also retrieved without the aid of gun or dog. When you brought it back to the referee it was a "dead bird." Plenty of foot work. Three and five bird



matches were popular. Then came a double hammer breech loader, with side action break. What a gun! Weight close to 10 pounds. Another "First Day" coming up; loading tools, white powder.

I found a mate. We read each issue of a mail order catalogue over and over. Then one day it was possible for me to order my pride and joy—a 16 ga. double hammerless gun, case, cleaning rod, shell vest and compass. What an outfit—less than \$25.00! I still have it and I still love it. Got it for "First Day" of grouse season about 1914.

From then on until the present time it has been pleasant experiences repeated over and over of a new gun or rifle, more practice, another "First Day;" clay targets, hunting, archery tournaments, another gadget, another trip to the mountains, hunting with bow and arrow or high power rifle, more practice, more "First Days."

So with more than a 100,000 rounds of ammunition and 250,000 arrows shot in 15 states, 50 hunting seasons, 8 or 10 dogs and a truck load of equipment as a sort of rehearsal, I must get down to business, get my boots greased, get my stuff together and really get out here somewhere in Pennsylvania and get a rabbit or two, but I'll bet a nickel



- Break matches before throwing them away.
- Bury cigarette butts and pipe heels.
- Douse campfires with water.
- Always use the ash tray in your car.
- Be extra careful with trash fires.
- Use care in all woods operations.
- Know and obey the local fire laws.

#### **Always Be Careful With Fire In The Woods!**

**KEEP PENNSYLVANIA GREEN**  
AMERICAN FORESTRY ASSOCIATION

I will need some new gadget or piece of equipment before I get ready to take off on my next "First Day". . . . *The End*

#### **NO B & C BIG GAME COMPETITION THIS YEAR**

The Boone and Crockett Club recently announced that there will NOT be a Big Game Competition this year.

Two reasons are given for this decision. First, the financial burden of publishing the new 1952 edition of *Records of North American Big Game* and sponsoring the Big Game Competition in the same year is a deterrent. Secondly, the outbreak of the hoof and mouth disease in Canada has made it necessary for the Department of Agriculture to impose severe restrictions on the importation of big game trophies into the United States. As a result, fewer hunters are expected to take trips to Canada this year and a lowering of the quality of trophies is the natural consequence.

The Boone and Crockett Club hopes to resume the Competition as soon as possible. In the meantime they will continue to record fine trophies in the permanent records, and hope that these outstanding heads will be entered in future competition.

# Butler County

## Twenty-Sixth In A Series

*Note: If desired, this center sheet can be removed without damaging the magazine, by loosening the two center staples.*

### Land Area

The county contains 508,672 acres, of which 156,373 acres are forested. Publicly-owned land comprises 2,810 acres, of which 2,720 acres are State Game Lands.

### Topography

Butler county is situated on a plateau, and most of its land surface consists of gently rolling hills and wide valleys.

Principal streams draining the area are Muddy Isle, Connoquenessing, Breakneck, Slippery Rock, Buffalo and Bear Creeks.

### Transportation

Railroad transportation is furnished by the Baltimore & Ohio, the Bessemer & Lake Erie, the West Allegheny, and the Pennsylvania. The county is traversed by the Benjamin Franklin Highway (U. S. 422), U. S. Route 19, Pa. Route 8 and other important highways. There are 701 miles of improved State highways in the county.

### District Game Protector

District Game Protector Woodrow E. Portzline, 317 New Castle Street, Slippery Rock, has jurisdiction over Mercer, Marion, Venango, Allegheny, Slippery Rock, Cherry, Washington, Parker, Worth, Brady, Clay, Concord and Fairview townships.

District Game Protector Paul R. Miller, R. D. 2, Butler, has jurisdic-

tion over Muddy Creek, Franklin, Center, Donegal, Oakland, Lancaster, Connoquenessing, Butler, Summit, Clearfield, Jackson, Forward, Penn, Jefferson, Winfield, Cranberry, Adams, Middlesex, Clinton and Buffalo townships.

### Fish Warden

Clifton Iman, 115 Wahl St., Evans City.

### Agriculture

The county has never been a leading farm section, although dairying has recently been developed. 158,955 acres are under cultivation.

### Industry

Butler county is well supplied with mineral wealth, including clay, natural gas and petroleum. It was a leading center for the development of the great Pennsylvania oil industry, and furnishes a large part of the country's iron and steel products.

The principal products are iron and steel sheets, steel cars, lubricating oils and greases, pipes and tubing, iron and steel forgings, plate glass, bituminous coal, patent medicines, gasoline, limestone and cement.

### Historic

Butler county was settled in a large part by veterans of the Revolutionary War who were attracted to this section by the "Donation Lands" provided in 1786-66 as a bounty for these veterans of the war for independence. Pennsylvania's title to this region had been established by purchase from the Indians in 1784.

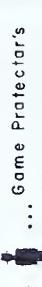
The first permanent settlers were David Studebaker and Abraham Snyder. They spent the winter of

V E N A N G O C O U N T Y

...KEY...



... Farm Game Project.  
(Open to Hunting)



Hedging Options



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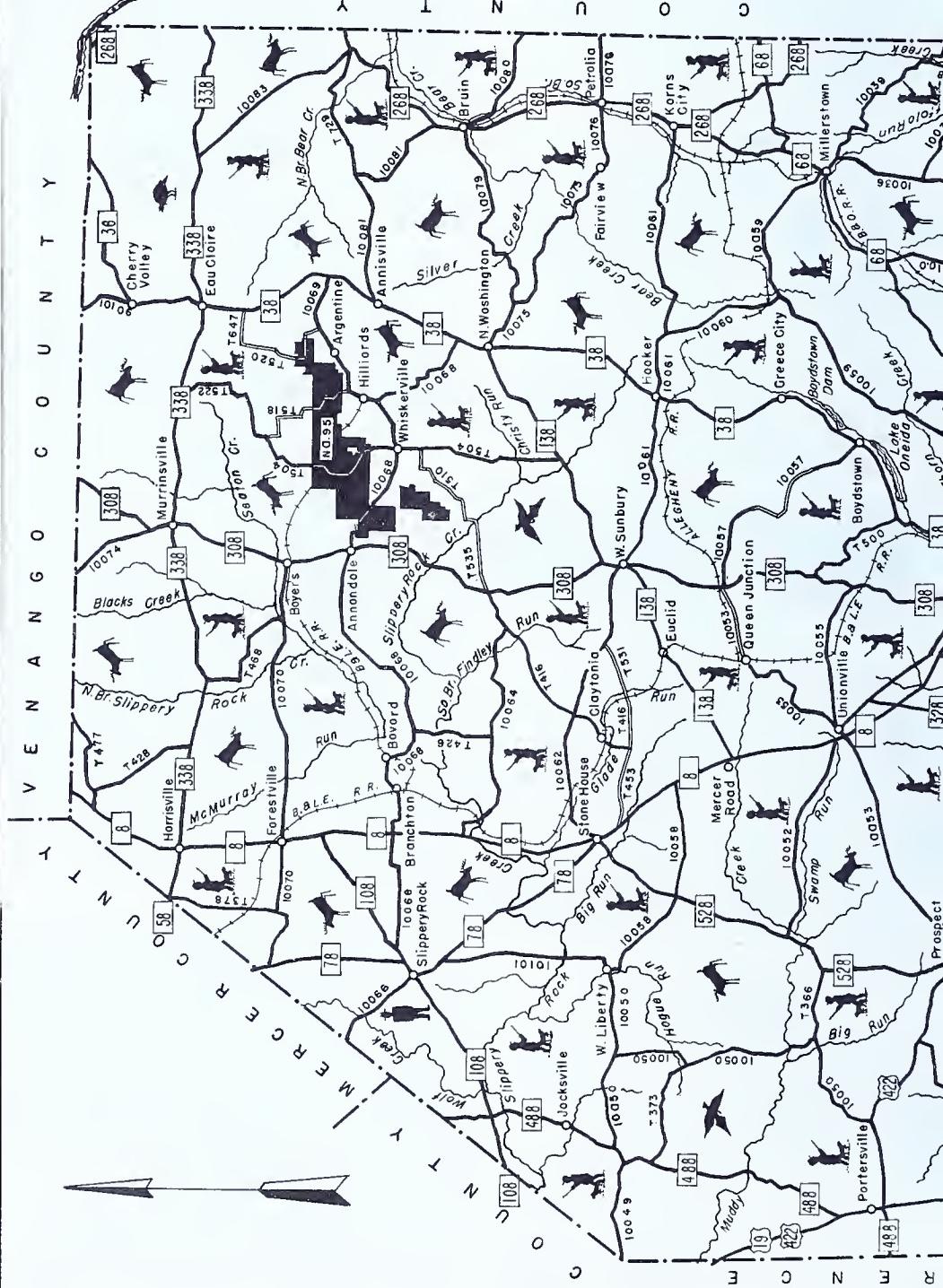
*Angouleme*: *Squirrel*



Stream.



38 Pennsylvania Rauten  
Number

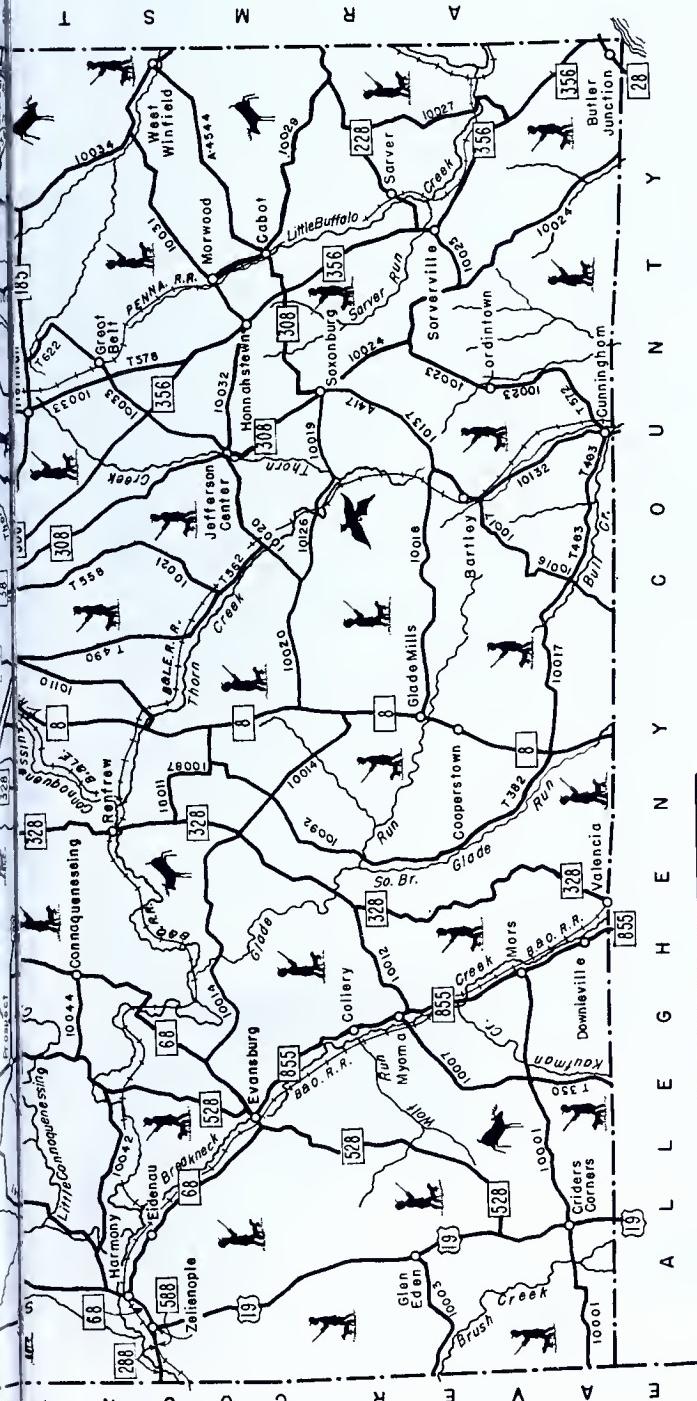


L-N-1952

BUTLER  
COUNTY  
PENNSYLVANIA

PENNSYLVANIA  
GAME COMMISSION

Scale in miles



1791 with the Delaware Indians near the site of Slippery Rock. The following year they moved into what is now Worth township.

Few counties were organized under more definitely pioneer conditions. Land had to be cleared to provide for the county town of Butler. The first courts were held in a hastily built log structure until 1807 when a brick courthouse was built. The first houses in the county were constructed in 1807.

The pioneers of the region were from a variety of racial strains. Some were from Lancaster county seeking new lands, many were from Westmoreland, Washington and Allegheny and other Pennsylvania counties, and numerous German settlers drifted into the county in search of economic opportunity and religious liberty.

Pennsylvania's oil industry made great strides in Butler county in its earlier years, and the county soon became synonymous with iron and steel industry. John A. Roebling, who founded Saxonburg in 1835, became one of America's leading engineers and his invention of the wire rope made possible innumerable modern structures and machines. It revolutionized the bridge building industry by making possible the suspension type of construction. One of these bridges was the Brooklyn bridge, which was designed by Roebling himself.

Petrolia was so named because of the oil industry. A boom town in 1872, it reached a population of more than 2,000 almost overnight on news of the discovery of "black gold."

The last Indian tragedy in the State, the murder of James Wigton and his family by a Complanter In-

dian, occurred in Brady township. This township was named for Captain John Brady, hero of the Indian Wars and the Revolution.

Butler pioneered in the development of small, lightweight automobiles and may be credited with the invention of the "jeep."

#### **Recreation—Fishing**

Fishable waters (name of stream or lake, fish stocked, location and length or area of stock waters) include: Bear Creek, brown and rainbow trout, Bruin, 12 Mi.; Buffalo Creek, brown and rainbow trout, Millerstown, 5 mi.; Little Buffalo Run, brown and rainbow trout, Butler, 4 mi.; Little Connoquenessing Creek, brown trout, Butler, 6 mi.; Silver Creek, brown and rainbow trout, Bruin, 7 mi.; Slippery Rock Creek, N. Br., brown trout, Harrisville, 3 mi.; Thorn Creek, brown and rainbow trout, Butler, 10 mi.; Connoquenessing Creek, black bass, Butler 12 mi.; Glade Run, black bass, Butler, 4 mi.; Sportsmen's Club Lake, Harmony-Zelienople, black bass, Zelienople, 15 A.; Slippery Rock Creek, black bass, Elliot Mills, 9 mi.; Wolf Creek, black bass, Butler, 8 mi.

#### **Recreation—Hunting**

Hunting is primarily of the small game variety, particularly in the southern two-thirds of the county, where rabbits, ringnecks and other game furnishes the bulk of the sport. Fair to good deer hunting can be found throughout most portions of the county, as well as grouse and a limited number of turkeys.

State Game Lands in the county include the following: Number 95, Eau Claire, 2,321 acres; Number 164, East Butler, 399 acres.

. . . *The End.*





COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA GAME COMMISSION  
HARRISBURG

Fall, 1952

Dear Mr. Grouse Hunter:

Here we are again to ask for your help. We know that every one of you is vitally interested in the future of this grandest game bird of all, and in the future of your sport. The Wildlife Research Division of the Pennsylvania Game Commission is just as concerned about its prosperity as you are. At present, we are conducting research to attempt to find out the causes for the grouse cycle and how we might combat it or live with it best.

Because the grouse is cyclic and fluctuates greatly in numbers about every ten years, we feel that we cannot manage the bird properly unless we know the exact stage of the cycle constantly. When we are in the "low" of the cycle, it probably would be a wise policy to restrict our hunting take somewhat. But during the "high", perhaps we should liberalize our seasons and bag limits markedly since most of our grouse are going to be lost anyway.

You are being asked to aid us in securing information on this bird, because we feel that you are interested enough in the future of your sport to be willing to provide us with accurate, dependable data.

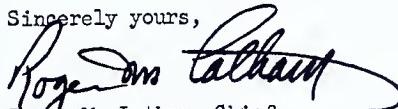
We would like to have you do two things for us: First, save the tip joint (with feathers attached) of one wing from each bird. This is called the pinion joint and holds the primaries (outer flight feathers). From these wings we can determine the age of the birds and find out how successful the hatching and brooding season was. If there are several young birds for each adult, we know that everything is normal and that we are on the upswing of the cycle. If we find only about one young bird for each adult, it probably means that we are near the bottom of the cycle and birds are going to be scarce.

Second, save the two middle tail feathers of the grouse you kill. These should be pulled out so that the whole feather remains intact. From these we can sex the birds.

Finally, tie the two tail feathers and the wing tip together for each bird and forward all you have to us at the end of the season or deliver to the nearest salaried game protector. Try to get as many as you can from your hunting companions and neighbors, too.

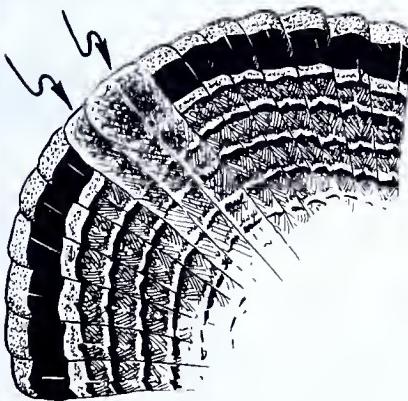
Here's good luck to you again this year, and please let us hear from you.

Sincerely yours,



Roger M. Latham

Roger M. Latham, Chief  
Wildlife Research Division





## *Outdoor Kids*

By Hal H. Harrison

ON a crisp, frosty afternoon in late October, Billy and Jane had their first experience with wasps. They found the big pear-shaped nest of a colony of white-faced hornets, hanging from the bottom branch of a tree.

The white-faced hornets are known as "paper wasps" because they build their nests of paper which they themselves make by chewing bits of wood into fine pulp. Inside the nest are thousands of little cells, their openings hanging downward.

Now hornets are the largest and most vicious members of the wasp family, so Billy and Jane were very careful about coming close to this nest. They knew that hornets get very angry and sting people who disturb them around their nest.

But this nest was no longer in use. On the ground, directly under it the children found the bodies of many dead hornets.

These had served their purpose on earth, and as the cold days of late autumn announced the coming of winter, they died. All the great hordes that made up the busy colony had died . . . all but the queens.

The queens had crawled away from the nest to protected places in the woods. Here they would stay until the warm days of spring stirred them from their sleep. Then they would fly off, to lay their eggs and to begin a new colony of hornets.

Wasps can be divided into two general groups . . . solitary and social. The solitary wasps are those that live alone; the social wasps are like their near relatives, the bees. They have colonies.

Good examples of solitary wasps are the mud-dauber wasps. Billy and Jane found the pipe-organ nests of mud-daubers on the porch roof of a cabin in the woods one day. These wasps are not vicious, like hornets, so the children were able to watch the female at her work.

They saw her carrying mud from the bank of a nearby creek to build the tubelike nests. As each tube was completed, the wasp carried inside paralyzed spiders (which she had stung) and stored them there. The wasp then laid an egg in each cell and sealed it shut.

The larva or grub, when it hatches from the egg, feeds upon the spiders. In one tube which they opened, Billy and Jane counted seventeen spiders, all living but all helplessly paralyzed.

After a larva changes to an adult wasp, it eats its way out of the mud cell and flies off to live its own life.

Another solitary wasp, the cicada-killer wasp, paralyzes cicadas and places them in her underground burrow as food for her larvae.

Yellow jackets are closely related to the hornets. As social wasps, they build community nests, some underground, some hidden in rock walls or under logs.

. . . . The End.

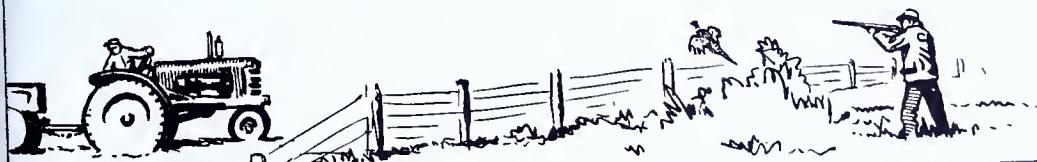
#### "HOW TO SHOOT" CARTOON BOOK

Containing twelve pages of colored cartoons, illustrating many interesting phases of shooting, a little booklet titled "How to Shoot" is now offered free by the Advertising Division of Remington Arms Company, Inc., Bridgeport, Conn.

Directed particularly to boys and girls, "How to Shoot" pictures safety methods, shooting positions, how to align sights, how to make targets and describes various games and contests which can be easily organized and conducted among small or large groups. Full instructions are given for the building of safe indoor and outdoor rifle ranges.

The free booklet is being distributed through sporting goods and hardware stores. Copies can also be obtained by writing Advertising Division, Remington Arms Company, Inc., Bridgeport, Conn.

## HUNT SAFELY... Keep away from workers in fields





By Herbert Kendrick

**A**T THIS beautiful time of the year when the forests and fields become ripe with color, and every sporting publication displays thrilling photographs of dogs and game, the hunter realizes he must have a gun dog to share with him the glorious season ahead.

Of course he should have made his plans and purchased his dog many months previously, but too many obligations robbed his time and now he must act swiftly.

Be alert and practical when you purchase a trained gun dog because unfortunately some kennels and dog dealers are dishonest, even though they may be no worse than any other class of men who buy and sell live animals.

In all the field magazines many dogs are advertised for sale by publishing a picture, stating the great qualifications, and quite often the faults are omitted. To me it has always seemed that dogs are not adapted to mail-order business, so it is far better to visit the kennel to purchase a desired animal. First, decide the breed and sex of dog you desire, then check with dependable dog men and have them recommend the proper seller. Next, write to him stating your needs, and if he has a dog that he feels will suit you, by all means, make the trip to the home of the dog and have the handler take him into the field where you are able to judge for yourself the dog's pace, nose, style, endurance and ability. There you will see him operate under normal conditions where he is unaffected and unafraid. If you are not

# Purchasing A Gun Dog

satisfied with the performance and the dog owner has no others to offer, then repeat the process at some other place. It will be worth your time and money to be sure. However, if the action of the dog is acceptable to you, buy him and take him home, but be certain you have made a friend of him before going afield. He may leave you or he may refuse to work for you. This does not mean you have made a mistake in the dog. It is perfectly natural for him to miss his former master, yet if treated kindly and friendly it is amazing how well adapted he will become in a short time.

If it is an impossibility to visit the kennel when you buy and you are dead set on ordering a dog, call the owner by telephone clearly stating your choice, and be certain you are understood. Then have him write you a concise description of the dog, his work in the field, and send a recent photograph along with a copy of his pedigree. Insist on the dog being sent on a ten day trial basis. In other words, place the money in the hands of the express agency when the dog is received, keep him a few days, give him a thorough but fair workout, and if you are satisfied instruct the express agent to send the money to your seller. If the dog has been misrepresented then you have a right to return him and your money is refunded. If this be the case your only loss is the charge of shipment.

Buying a puppy is a much more simple transaction. Here you select the very best breeding you find offered—close your eyes and hope for

the best. If you can visit the kennel to select the puppy you will select the healthiest looking one who warms up to you at once. Picking the best of a litter is often more luck than judgment and skill. Too often we find the sickly ugly runt of a litter turn out to be in the superlative class.

My only sad experience with a dog salesman came when I bought a setter that kept every neighbor awake all hours of the night with the most pitiful cries you ever heard, and the owner had sworn he was very quiet at night.

With this one exception I have found many good friends and wonderful sportsmen who earn their living by selling gun dogs. I know of cases where they have lost money to satisfy a client. There are many who re-

fuse to sell a dog unless they know the buyer, and are satisfied the dog will have a good home.

When buying a dog please don't expect a thousand dollar dog for a hundred. If your taste runs high in hunting stock, it will have to be matched by your billfold. In gun dogs, as in every other field, you get only that for which you pay.

Be careful of whom you purchase your dog. If you buy from the reliable you help him help yourself, and also aid in eliminating the unreliable ones.

If you fail to get a dog this season plan to hunt with someone who can furnish a trained dog for use on game and be certain he is a qualified retriever. Please do not leave wounded game this year.

. . . *The End.*

#### FOOT AND MOUTH DISEASE QUARANTINE STILL IN EFFECT

Although Canada is taking vigorous and apparently successful action to stamp out foot and mouth disease among its cattle, there is no prospect that regulations imposed by the Federal Government of the United States relative to the importation of hooved mammals will be relaxed before next year, the Wildlife Management Institute reports. This regulation will have important effects on the plans of many American sportsmen.

No meat or hides of deer, moose, elk, or other hooved game may be imported unless the meat is thoroughly cooked or unless the hides are hard-dried or tanned. Horns, antlers, hooves, and similar portions must be completely clean, dry, and free of bits of undried flesh. All such trophies must be inspected at the port of entry. Since most of these regulations are impractical from the standpoint of the hunter, the Bureau of Animal Industry recommends that any trophies be processed by Canadian taxidermists before being imported. Mounted trophies can be imported without difficulty.

Game birds and all non-hooved game are not affected by the regulation and these may be imported from Canada subject to the usual restrictions imposed by Canadian and American authorities.

The Bureau states that it will require a number of months to determine the success of eradication programs north of the border, and until they are certain, the present restrictions will remain in effect.

#### WHY NOT START A SCRAPBOOK?

A reader recently suggested that GAME NEWS covers and illustrations would make an interesting and educational scrapbook collection. We might add that from time to time some very worthwhile articles could be clipped from the pages of GAME NEWS, write-ups that would prove invaluable to the conservation-minded reader. Combined with suitable illustrative material salvaged from old copies of our magazine these could make your scrapbook a veritable encyclopedia of hunting, wildlife and conservation lore.

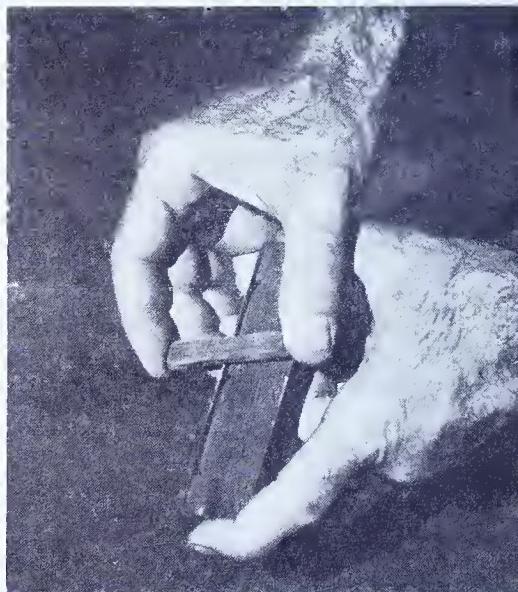
School children, too, will find use for this material in the classroom, and the parent would do well to keep on hand an assortment of pictorial and instructive material.

# Talking Turkey

Calling wild turkeys is an art. One of Pennsylvania's Game Protectors who has lived and worked in wild turkey country all of his life made the sage remark: "Those darn things have saved more turkeys lives than anything I know." In the hands of the novice, they are a tremendous handicap to his success, but, in the hands of the expert, they mean a turkey in the bag. The hunter who manages to get his turkey year after year is almost invariably a turkey caller. And he gets far more from his sport than the more ordinary "still" hunter or the "I was just in the right place at the right time" hunter. An accomplished turkey caller is proud of his skill and delights in the enjoyment it brings.

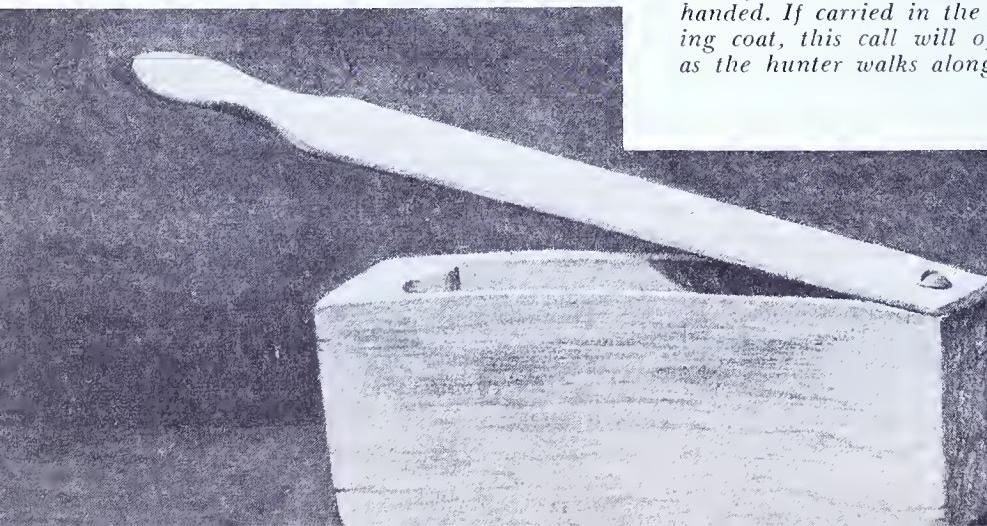


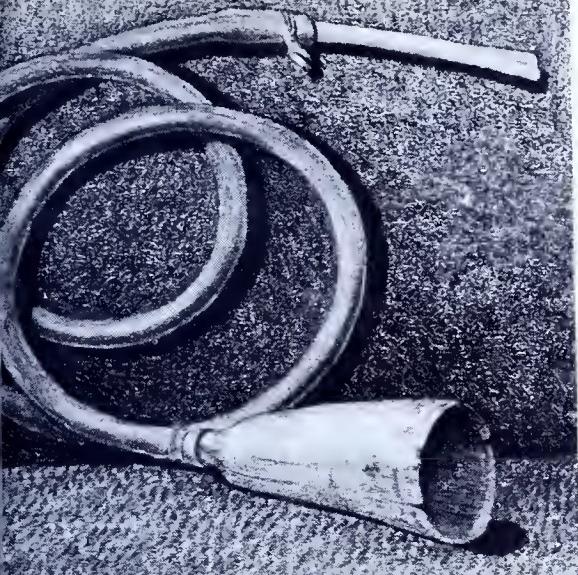
Various types of "box" calls are most universally used by turkey hunters. The type shown above is equipped with a wooden scraper which is thoroughly chalked to prevent false notes. Both the "purr" and the "yelp" are readily reproduced.



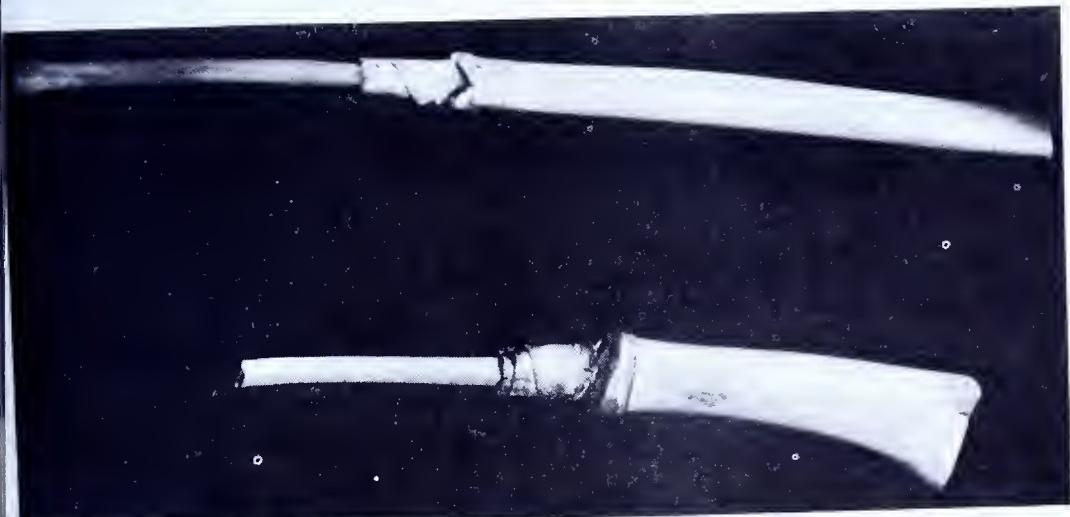
Box calls are often made of red cedar but may be partially or wholly made of various hardwoods. Above, a slate "scraper" is used to produce the rasping notes of the turkey. As with all calls, only "practice makes perfect."

The Gibson call below, utilizes the lid as a scraper. One of the best of the box calls, it may be used either left handed or right handed. If carried in the back of the hunting coat, this call will often "talk turkey" as the hunter walks along.





This rubber diaphragm caller, above, is placed inside the mouth and the turkey imitated by short puffs of air from the throat. Although a difficult call to master, it is one of the most realistic in tone, is easily carried and leaves both hands free for shooting.



An old reliable model, upper left, is made from the small turkey wingbone attached to a cow horn amplifier by means of a length of rubber hose. The sound is produced by sucking on the end of the wingbone.

The "wingbone" calls, center, are constructed by combining the small and large bones found in the second joint of the wing of the wild turkey. One of the first devised, this call has accounted for the downfall of turkeys for generations.

The cocoanut shell call, right, with peg of seasoned laurel is a favorite in south-central Pennsylvania. An "old timer" can gobble, pert, yelp, and purr on this versatile call. It is considered one of the best, and is easily made. The cocoanut shell must be thin.

PGC Photos By Cady  
Captions By Latham





By Ed Shearer

**O**NE question that I am running into with increasing frequency is "What gun is best for my wife or maybe my best girl?" It seems the gals are invading the outdoors in ever increasing numbers and today's crop gives every evidence of being really good.

There appears to be a great difference in the attitude of today's outdoor women. In the past most of the Diana's took to the outdoors either to please some masculine contingent of the family or because it gave them an opportunity to wear strange and bizarre clothes. Today's gals appear to like the sport and ask no odds of the man. They string the lowly worm on a hook without a qualm and refuse to go into hysterics on encountering a watersnake. The outdoors is no longer a fashion parade; blue denim Levi's and loose fitting comfortable shirts have come into their own.

Women make fine shooting partners, but for success and enjoyment the gun and ammunition must be fitted to the individual woman. Usually this is what happens.

The head of the family outfits her with one of his spare guns. Generally the reason it's a spare gun is that he cannot hit anything with it himself. In her hands it's a darn site worse.

Now they go afield. The stock is so long that she has to be an acrobat to reach the triggers. Or there is too much drop in the stock and she gets a wallop from the recoil that shakes her hair-do loose.

At the end of the day she is bruised and sore. One shoulder is sagging 4

## The Lady Wants A Gun

inches lower than the other from carrying an eight pound gun. She thinks, "If he calls this fun, the man's a lunatic—and I'm married to him."

Then there is the other extreme. This guy is over anxious to please the lady and in his fear of over-burdening her buys a .410 gauge that handles like a wand. So . . . a hunting they go. The shots she gets give even the old man plenty of grief with his open bored 12 gauge. The only thing the lady hits are sundry rocks with the tender ends of her toes, which she seems to do with unerring precision. She is disgusted and disillusioned so it's "back to the kitchen, Mary."

I believe a survey of causes that make women dislike the outdoors would show that poor or unsuitable equipment stands at the head of the list. Chief of these in the hunting field is the gun, so let's discuss its requirements.

First, it must be light enough so as not to make the lady consider herself a "beast of burden" during an ordinary day afield. Neither should it be so light that it will make her recoil-conscious, thus developing the flinching habit, shutting the eyes and kindred faults.

Second, the gun must be tailored to fit her physical proportions so that she can point it readily without becoming a contortionist.

Third, It must be capable of hitting and killing any game she is likely to encounter in a day afield.

In the shotgun line probably the best bet for the average woman is the 20 gauge. Now I have seen women that can handle the standard 12

gauge with the best of them. Take the former Mrs. Liela Hall whose ability to smash long series of clay targets kept her in top spots in the trapshooting world for years. The late Mrs. Ad Topperwein was another. It did not make any difference what kind of a gun you handed her, if it had a hole in the barrel Mrs. Top could make it talk. From all angles she was the greatest woman shot that ever lived, eclipsing even the famed Annie Oakley. There are hundreds more but invariably they have a lot of experience that the average woman will never acquire.

The .410 or 28 gauge guns with their thin patterns and limited range are not for the average woman or man either. It takes an expert to turn in a satisfactory percentage with these gauges. On the other hand, from the 16 gauge on up we start to run across either weight or recoil which is undesirable for the woman who is just starting.

The 20 gauge stands about midway between the two. With a full choked 20 gauge she can have a reasonably thick pattern that will give her clean kills on game up to 40 yards or a little better. At the same distance a high velocity load of one ounce of No. 6 chilled shot will kill the biggest turkey gobbler that ever strutted. I've seen that performed often enough to have no doubt of it. She has a range of shot sizes from No. 9 for quail and woodcock to No. 6 for duck and pheasants.

Many years ago when the model 12 Winchester pump came out I bought a 20 gauge trap grade with a straight grip stock, weighing  $6\frac{1}{2}$  pounds. The load, as I recall, was  $2\frac{1}{2}$  drams of Dead Shot powder and  $\frac{3}{4}$  ounce of  $7\frac{1}{2}$  chilled shot. This is below the average 20 gauge loading today, yet I killed more grouse in one season with that combination than I ever expect to kill the rest of my life.

The weight of a 20 gauge for a woman should not exceed  $6\frac{1}{2}$

pounds. Among some of the available guns that we will look at, some run as low as  $5\frac{1}{2}$  pounds. That is a bit low as there will be times when it is desirable to use the full ounce of shot in the high velocity loads and the recoil might be a little but rough for a woman who does not do a lot of shooting. A good compromise weight is 6 pounds for upland work. If it's a straight duck shooting proposition where there is not much carrying to be done,  $6\frac{3}{4}$  or 7 pounds would be better, as only the heavy high velocity loads would be used.

In types it's largely a matter of milady's preference. I personally lean toward the double for the beginning Diana. They usually have better balance, racier lines and the big advantage of two different borings that are available instantly. She can have one barrel bored improved cylinder for the largest possible spread for the first shot and the other bored full choke for the longest killing range of the gun. This is a big advantage as the average women does not recover from the first shot as fast as the average man, so her range for the second shot will be longer.

Another point that should not be overlooked is that the safety is mounted on the tang where it will give them no trouble to operate in a hurry. The cross trigger safety of the pump and auto type guns seems to give the average woman trouble in operating on fast unexpected shots, especially if it works a bit stiff. If it works too easy than it is no longer safe.

In regard to stocks women usually require about  $\frac{1}{2}$ " shorter stocks than men. Unless a "try gun" is available it is best to start with a standard stock and shorten it until it fits.

Among double guns that would fill the above specifications are the Stevens model 530, the Fox model B and the Winchester model 24. These guns run a bit over 6 pounds averaging around  $6\frac{1}{2}$  pounds. The tag is

in the \$70 to \$80 bracket. The Marlin over and under 20 gauge is a fine handling gun, as is the L. C. Smith field grade. They are not available with extra's and are in the \$100 class. In the custom class the Browning, L. C. Smith and the Winchester 21 start at about 250 bux and runs up to the mink coat bracket.

In repeating and semi-autos there is a large selection in models and prices. Stevens, Remington, Winchester and Ithaca all make repeating 20 gauge shotguns that run from  $5\frac{1}{2}$  to  $6\frac{1}{2}$  pounds. They should have muzzle devices and skeet extension fore-arms for woman's use. Savage and Remington both make 20 gauge semi-autos that weigh about  $6\frac{1}{2}$  pounds. They both have that long, hand filling forearm that women find so comfortable with their short arms. Prices run a little higher than the repeating shot guns.

In considering rifles the same things hold true as for shotguns although some other factors creep in. One is weight. We now enter the realm of deliberate aim and we need a bit more weight to steady the weapon. The idea is the shorter the range at which you shoot your game the lighter the rifle can be. Conversely, the longer the range the heavier the gun must be for steady holding. As 99% of the deer are killed within 150 yards, any gun that will do this is adequate.

A good choice for a woman is the .250 Savage in the 99 model. It weighs  $7\frac{1}{2}$  pounds and with the 100 grain bullet has a light recoil. Furthermore, it has sufficient accuracy for varmints in the off season without reloading.

The lever action carbines in the Winchester and Marlin 336 line that

handle the .30/30 class of cartridge are fine guns for women. These rifles running 6 to  $6\frac{3}{4}$  pounds and with short stocks measuring 13 to  $13\frac{1}{2}$  inches will fit most gals. Their moderate recoil and price make them the most popular models on the market.

In the bolt actions the .257 Robert has more steam than the .250 Savage and can be used on larger game with the 117 grain bullet. One of the best hunting rifles for a woman is the .250 Mannlicher with 6 pounds of weight and beautiful balance. It's close to the ideal but a bit expensive. For game larger than deer a Mauser 7 mm with custom loads is hard to beat from the standpoint of recoil and effectiveness. A properly placed shot will kill anything on this continent. The .270 and .30-06 class of rifles are not for the average woman. Their recoil and muzzle blast call for more seasoning than most women will get.

Let it be stated here that no woman should be started on a high power rifle. She should learn the holding, aiming, squeezing and other mechanics of shooting with the .22 caliber. You will be surprised at how fast she will come along. Women usually have fine coordination and a sensitive touch on the trigger that keeps the average man dusting to acquire.

Now there is another angle to be considered. A good gun and outfit is just as much an investment as a new electric stove or a living room suit and it will pay more dividends in pleasure, health and mutual understanding than either. So if the lady has a yen for the outdoors start her right. Sell your own cast offs to the junk man.

. . . The End.

#### FREE HUNTING LICENSES TO SERVICE MEN DISCONTINUED

In accordance with an opinion handed down by the Pennsylvania Department of Justice, July 31, 1952, the Pennsylvania Department of Revenue directed the County Treasurers to discontinue the issuance of free hunting licenses to members of the armed forces.

This action was necessitated because the state of war between the United States was decreed to be terminated.

# Got A License?

*A list of all licenses, permits and tags issued by, or under the jurisdiction of the Pennsylvania Game Commission, published for the convenience of our sportsmen-readers.*

Kind	Cost	Where Obtainable in Pennsylvania
Resident Hunter's License ..... (Bona fide residence of 60 days in Commonwealth required before being eligible for license, excepting that a regularly enrolled member of any of the United States Armed Forces officially stationed within Pennsylvania for 30 or more days next preceding his application, shall be entitled to purchase a Resident Hunter's License.)	\$ 3.15	Dept. of Revenue, Misc. License Section, Harrisburg County Treasurers Issuing Agents throughout Pennsylvania.
Resident Hunter's License (Resident disabled veteran of any war—with loss or loss of use of one or more limbs.) .....	Free	County Treasurers
Nonresident Hunter's License (does not include trapping) .....	20.00	Dept. of Revenue, Misc. License Section, Harrisburg County Treasurers
Nonresident Trapper's License (does not include hunting of any kind, collection of bounties, or beaver trapping) .....	25.00	Game Commission, Harrisburg
Alien Nonresident Hunter's License (trapping prohibited) .....	20.00	Dept. of Revenue, Misc. License Section, Harrisburg
Replacement of Lost License and Tag (required when either the license or tag, or both, are lost)	1.00	Dept. of Revenue, Misc. License Section, Harrisburg, or agent who issued original license.
Antlerless Deer License .....	1.15	County Treasurer (of County where applicant desires to hunt when antlerless deer seasons are declared)
Special Archery License (required for hunting deer with bow and arrow only during Special Statewide Archery Season and on Special Archery Preserves during any open season) .....	2.00	Dept. of Revenue, Mics. License Section, Harrisburg
Permit to Disabled Veteran (suffering from paralysis of both legs, or one leg and one arm, or either side of the body, or amputation of both feet, or one hand and one foot, if service-incurred) to hunt while using an automobile .....	Free	Pennsylvania Game Commission, Harrisburg
Ferret Breeder's or Dealer's Permit .....	25.00	Wildlife Conservation Division Offices (Field)
Ferret Possession Permits ..... (for each ferret)	5.00	" " "
Fur Dealer's (Nonresident) .....	100.00	" " "
Fur Dealer's Permit (Resident) .....	10.00	" " "
Fur Dealer's Employes' Permit (Resident) .....	5.00	" " "
Fur Farming Permit .....	5.00	" " "
Game Propagation Permit .....	5.00	" " "

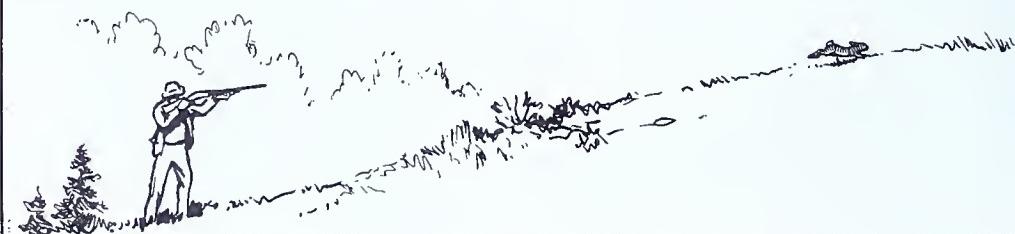
(Continued from Page 45)

Kind	Cost	Where Obtainable in Pennsylvania		
		Pennsylvania		
Metal seal to tag imported game for sale, excepting deer or rabbits (1 attached to each carcass) (each)	.05	Wildlife Conservation Division Offices (Field)		
Permits for Field Trials (not to exceed 5 consecutive days) ..... (each trial)	5.00	"	"	"
Permits for Fox Hunting Clubs .....	50.00	"	"	"
Permits for Retriever Trial ..... (for each day)	10.00	"	"	"
Permit to possess pelts and have a protected bird or animal mounted (if accidentally killed) .....	1.00	"	"	"
Permit to ship trophies to taxidermists outside of Pennsylvania, for tanning or mounting, and return to owner .....	Free	"	"	"
Regulated Shooting Grounds Permit (for first 100 acres) .....	25.00	"	"	"
(for each additional 100 acres)	5.00			
Roadside Menagerie Permit .....	5.00	"	"	"
Scientific and Museum Collecting Permit .....	5.00	Game Commission, Harrisburg		
Special Dog Training Area Permit .....	10.00	Wildlife Conservation Division Offices (Field)		
Tags for Beaver Hides ..... (each)	.10	Wildlife Conservation Division Offices (Field), or District Game Protectors.		
Tags for shipping raw furs to fur dealers of other states ..... (each)	.25	Game Commission, Harrisburg; Wildlife Conservation Division Offices (Field), or District Game Protectors.		
Taxidermy Permit .....	25.00	Wildlife Conservation Division Offices (Field)		

#### HEADQUARTERS OF THE SIX WILDLIFE CONSERVATION DIVISIONS (FIELD) ARE AS FOLLOWS:

- Northwest Division —Box 107, 14 W. First St., Oil City, Pa.  
 Southwest Division —Box 348, 331 E. Main St., Ligonier, Pa.  
 Northcentral Division —Box 429, 214½ E. Water St., Lock Haven, Pa.  
 Southcentral Division —327 Penn St., Huntingdon, Pa.  
 Northeast Division —987 Wyoming Ave., Forty Fort, Pa.  
     (Mail to Box 1351, Kingston, Pa.)  
 Southeast Division —1009 N. 8th St., Reading, Pa.

## HUNT SAFELY ...



## HOW TO SECURE AN ANTLERLESS DEER LICENSE

The following information has been compiled as a quick reference for persons desiring to apply for Antlerless Deer Licenses. The counties are listed in alphabetical sequence with the County Seat of each county shown directly opposite the name of the county.

Applications (completely filled in) for Antlerless Deer Licenses, for the specific county in which you desire to hunt, should be directed to the "COUNTY TREASURER OF ..... COUNTY, COURT HOUSE, followed by the name of the County Seat.

COUNTY	COUNTY SEAT	COUNTY	COUNTY SEAT
Adams	Gettysburg	Lackawanna	Scranton
Allegheny	Pittsburgh	Lancaster	Lancaster
Armstrong	Kittanning	Lawrence	New Castle
Beaver	Beaver	Lebanon	Lebanon
Bedford	Bedford	Lehigh	Allentown
Berks	Reading	Luzerne	Wilkes-Barre
Blair	Hollidaysburg	Lycoming	Williamsport
Bradford	Towanda	McKean	Smethport
Bucks	Doylestown	Mercer	Mercer
Butler	Butler	Mifflin	Lewistown
Cambria	Ebensburg	Monroe	Stroudsburg
Cameron	Emporium	Montgomery	Norristown
Carbon	Mauch Chunk	Montour	Danville
Centre	Bellefonte	Northampton	Easton
Chester	West Chester	Northumberland	Sunbury
Clarion	Clarion	Perry	New Bloomfield
Clearfield	Clearfield	Philadelphia	Philadelphia
Clinton	Lock Haven	Pike	Milford
Columbia	Bloomsburg	Potter	Coudersport
Crawford	Meadville	Schuylkill	Pottsville
Cumberland	Carlisle	Snyder	Middleburg
Dauphin	Harrisburg	Somerset	Somerset
Delaware	Media	Sullivan	LaPorte
Elk	Ridgway	Susquehanna	Montrose
Erie	Erie	Tioga	Wellsboro
Fayette	Uniontown	Union	Lewisburg
Forest	Tionesta	Venango	Franklin
Franklin	Chambersburg	Warren	Warren
Fulton	McConnellsburg	Washington	Washington
Greene	Waynesburg	Wayne	Honesdale
Huntingdon	Huntingdon	Westmoreland	Greensburg
Indiana	Indiana	Wyoming	Tunkhannock
Jefferson	Brookville	York	York
Juniata	Mifflintown		

Application blanks may be obtained from County Treasurers; hunting license issuing agents; Pennsylvania Game Commission, Harrisburg; Pennsylvania Department of Revenue, Harrisburg; and Game Protectors.

**DON'T SHOOT OVER THE SKYLINE**





## Commission Doubles Contribution To Wildlife Unit

The Pennsylvania Game Commission has approved an additional sum of \$6,000 for the Pennsylvania Cooperative Wildlife Research Unit, supported jointly by the Commission, the U. S. Fish and Wildlife Service, Pennsylvania State College, and the Wildlife Management Institute. This is double the amount of the departmental contribution specified in the agreement under which each Unit functions.

The Pennsylvania Wildlife Research Unit, established in 1938, is entering its fourteenth year of activity in investigating game problems in the Keystone State. The increased funds available will be used, according to Dr. Ward M. Sharp, Unit Leader, for extending the program of research and investigation, and in training young men in the wildlife management profession. Units, to date, have been established at 17 land grant colleges in the United States and at the University of Alaska. Each is headed by an experienced biologist who conducts long-term research into the wildlife problems of the state and supervises similar research work by graduate students of the Unit college. In this way valuable information is uncovered, and men trained to conduct state and federal wildlife programs in future years are given an opportunity to obtain practical experience in their field.

## Pennsylvanian Holds Top Office in OWAA

Seth L. Myers of Sharon, energetic secretary of the Northwest division

of the PFSC and president of the Pennsylvania Outdoor Writers association, was unanimously elected first vice-president of the Outdoor Writers of America during the group's annual convention at Miami, Florida.

Our Pennsylvanian is, "The Outdoor Commentator" over radio station WPIC, Sharon, and also writes a syndicated outdoor column for 32 newspapers in the northwestern section of the Commonwealth. Myers was daddy of Pennsylvania's famous program of conservation activities during National Wildlife week in March of this year.

Myers, for years a national director of the OWAA, now holds one of the most enviable spots in the organizational pattern of the nation's growing family of outdoor writers. J. Hammond Brown, revered *Baltimore News-Post* writer, was retained as president.

## Indiana Gets Conservation Into Classrooms

Indiana's Department of Conservation is encouraging the teaching of conservation in public schools by distributing textbooks on the state's natural resources accompanied by manuals for instructing teachers on how to present such material to their students, the Wildlife Management Institute reports.

An unusual feature of this program is the injection of conservation teaching into the lowest grades of school through simply worded but beautifully illustrated booklets on the wildlife, trees, and plants of the state. More advanced material is available for the higher grades.

## Director Addresses International Conservation Body

On September 12, Thos. D. Frye, Executive Director of the Pennsylvania Game Commission, addressed the International Association of Game, Fish and Conservation Commissioners at Dallas, Texas. His subject was "How Can Wildlife Management Keep Pace with Modern Trends?"

Before developing his thesis, Frye paid tribute to capable pioneers who aid firm conservation foundations and who "were the signers of the Declaration of Perpetuation for Wildlife." He specifically lauded Pennsylvania's Grand Old Man of Conservation, John M. Phillips.

Frye keynoted his address with the statement, "The serious and difficult problems of today do not stem from wildlife but from people." Then he developed this theme: Conservation agencies cannot do the natural resource job alone. Once there is an understanding, cooperative public our wildlife problems will become relatively simple.

Frye classified people in three categories—"protectionists," "animalizationists" and "conservationists." He proceeded to tell how the three groups could be welded into a composite of conservation understanding and action through education and able leadership.

He dwelt upon the value of the press, outdoor writers and radio in

*A well informed public is a cooperative one. Below, District Game Protector Carl Benson addresses a group of Boy Scouts at Camp Tionesta in the Allegheny National Forest. The program consisted of color-sound movies, a live snake exhibit and lecture, a deer antler exhibit, and a display of native furbearers.*

PGC Photo By Parlaman



carrying the conservation message to the people accurately and interestingly.

Frye then outlined how research, law enforcement, predator control, food and cover development for wildlife, and artificial propagation may be used as management tools with better results.

In the second phase of his speech, Frye directed attention to all-important fundamentals in organizational structure that determine whether a wildlife agency will operate on a high plane and show progress and good results. He pointed out the need for carefully selecting, training and retaining high quality personnel; told why effective wildlife agencies must have, and be familiar with, modern equipment; and stressed the importance of analyzing errors for greater efficiency in the future.

In closing, Director Frye said: "If I were asked to write a prescription that would serve as a cure to our present-day wildlife ills . . . it would consist of only two words—COMPETENT PERSONNEL. Competent personnel alone will do the job. Competent personnel will enlist the public in behalf of wildlife, will solve the future wildlife problems and will perpetuate that God-given heritage of sports afield."

### Farm-Game Supervisor Wins Canadian Shoot

Mert Golden, supervisor of the Farm-Game Section of the Pennsylvania Game Commission, won the Canadian National Pistol Championship for 1952 in Ottawa recently. Another Pennsylvanian, Ben Rosen, also of Harrisburg, placed fourth in the grand aggregate championship match.

The championship match consisted of .22 caliber pistol and .38 caliber revolver aggregate shoots. A series of four matches comprised each event, and the combined matches constituted the grand aggregate.

The event, held at the Connaught Rifle Ranges at Ottawa, Ontario, was open to the Royal Canadian Mounted Police, Canadian military branches, Canadian civilians and invited Americans. Among the American entries were a police contingent from Buffalo, N. Y., and several police from Binghamton, N. Y.

### California State Teachers College Offers Course in Conservation

In recognition of the importance of teaching conservation of natural resources in our public schools the California State Teachers' College has instituted a course for teachers and prospective teachers in which the classroom lectures and discussions are supplemented by first-hand contacts with conservation workers and advisors in the field. The following details of the course were supplied by John F. Lewis, Professor of Biology at the College:

The course meets once a day, five days a week, for three weeks, for three hours a day. The instruction consists of lecture, discussion, outside reading, field trips, and the examination of available literature in the field.

Three field trips are taken: (1) a combined farm and forest trip going over the conservation-worked farms in Fayette county with either Mr. Rex E. Carter, the County Farm Agent, or his assistant, Mr. John H. Wykoff; in the afternoon, with Forest Fire Inspectors George Martin and "Pat" Brady, and towerlady of the Pond Field forest fire tower, Miss Betty Addis, discussing forest fire detection problems, actual use of forest fire fighting tools, and other forest materials; (2) a combined strip mining, strip mine rehabilitation and wildlife management trip to Burgettstown where the Harmon Creek Coal Company takes care of the group in the morning, demonstrating



PGC Photo By Parlaman

Graduate students of California State Teachers College on a field trip in conjunction with their course in conservation of natural resources. District Game Protector Ray Doerzbacher is addressing the group.

all of their practices from opening up a strip mine area, drilling, loading, blasting, use of the big shovel to clear the overburden, cleaning the face of the coal bed, loading, backfilling, grading to slope, replanting of grass, other herbs, and trees, and nursery practice. The demonstrations in charge of Mr. Robertson, the Company Superintendent, Mr. Boni, the general foreman, and Mr. Allison, in charge of planting operations. The afternoon is spent on Game Lands 117, in charge of Mr. Doerzbacher, the District Game Protector, and Mr. Parlaman, the Conservation Education Assistant, where game lands and protection problems are stressed and the make-up and work of the Game Commission generally is discussed. The third week, a long trip into

Somerset County to visit (a) Kooser roadside park, where its problems are studied under the leadership of Mr. Ronald Cox, the Park Foreman, and (b) to Laurel Hill State Park, where all of its contributions are studied under the direction of Mr. Herbert Laughery, the general Park Foreman there.

The purposes of these trips are threefold—(1) to supplement the classroom lectures, discussions, and outside readings with actual demonstrations of work on the land, (2) to have the class members meet and know the operating personnel of the organizations delegated the job of overseeing the work of conservation in the State, and (3) to illustrate to the teachers-in-services and teachers-in-training enrolled in the course the

value of the field trip as a means of visual education.

Basic problems treated in the conservation of natural resources course are as follows:

1. The need for a favorable balance of life in Nature.
2. The aspects of the conservation cycle (acquisition of land, the legend of inexhaustibility, a period of alarm, a period of protection and restriction on use, a period of the development of scientific policies of wise use, and land-use planning on a national scale).
3. Water—the great regulator.
4. Soil—the basic natural resource.
5. The problem of food-producing lands (agricultural and grazing areas).
6. The problem of forest lands.
7. Wildlife problems (combining both fish and game).
8. Areas for special use (primitive areas for scientific study, historic worth, recreation, etc.).
9. The problem of mineral conservation.
10. The conservation of human life.
11. Land-use planning on a national scale.
12. The individual and the conservation program (pointing out ways in which the individual can practice conservation, and how, as a teacher, the individual can carry conservation teaching into the classroom).

### Pheasant Chick Program Grows

In 1933, for the first time, the Game Commission shipped a few thousand young ringnecks to sportsmen's organizations to rear to maturity. These were birds in excess of the number the state game farms could raise to liberating age with their facilities.

The project grew steadily until, in 1950, about 166,000 day-old ringneck chicks were distributed for rearing outside the pheasant farms. Last year the number increased to more than 225,000. This year, the total is almost 228,400, the largest number yet.

Sportsmen's clubs, Farm Game Project cooperators, rabbit farm cooperators, and farmers who have fifty or more acres open to public hunting and have the required rearing equipment may apply for the pheasant "peeps." (The project is closed for 1952).

It is no longer unusual for organizations and individuals participating in this program to successfully raise nearly 100% of their pheasant chicks to maturity. Last year the success of all these "amateur" propagators was recorded at more than 80%.

Pheasants reared by sportsmen's organizations are liberated by these groups in their own localities. The



ens reared by organizations other than those of sportsmen are retained, afe and healthy, in large Game Commission holding pens and are released he following spring as brood stock.

Field checks and hunting success where the described pheasant rearing, liberating and hen hold-over plan have been in effect show there has been an encouraging increase in the pheasant population in these areas.

### ANNOUNCE FOURTH ANNUAL FEDERAL "DUCK STAMP" CONTEST

Complete details of the fourth annual contest to select the 1953-54 federal "duck stamp" are contained in a leaflet which is now available from the Fish and Wildlife Service, Washington 25, D. C., according to an announcement made today by Albert M. Day, Service Director.

This public contest is open to all interested artists—amateurs as well as professionals. Entries submitted in accordance with contest rules must reach the Service's headquarters office in Washington on or before January 12, 1953.

The Migratory Bird Hunting Stamp—better known as the "duck

stamp"—has become familiar to all migratory waterfowl hunters and to philatelists and conservationists throughout the country since the first issue in the series went on sale in 1934. Nearly twice the size of a special delivery stamp, it costs \$2, and everyone over 16 years of age who hunts migratory waterfowl is required to have this stamp in his possession, validated by his signature.

Each year the design used on the duck stamp is chosen by a judging committee of waterfowl authorities from among entries submitted by artists from every part of the Nation.

The winning artist will receive no direct compensation if his design is selected but the distinction is unique and worthwhile. Many of the winning artists in former years have been able to capitalize on their designs by selling autographed prints; all such projects, however, are subject to the terms of the contract which the winning artist signs with the Fish and Wildlife Service.

Artists will be given a wide latitude in the choice of medium—pen and ink, oil, watercolor, etching, pencil, etc.—and in their subject. The subject, of course, must be a true-to-life portrait of wild waterfowl.

### BANNER WATERFOWL YEAR APPEARS IN OFFING

From all current indications, one of the most successful waterfowl seasons since the great duck decline of the 1930's appears to be looming on the horizon for North America's wildfowlers, according to the Wildlife Management Institute. The largest numbers of ducks, geese and brant seen in many years are now winging their way southward down the flyways or are massing in northern waters for their seasonal journey to the southern wintering grounds.

Ten days have been added to the open season in all four Flyways of the United States, resulting in a 55-day open season on the Atlantic Flyway. Bag and possession limits remain essentially the same as last year because of an expected increase in hunting pressure due to larger numbers of hunters afield, more leisure time, and improved transportation. This longer season should assure hunters in all states of good hunting even if abnormal weather should hold the flights back later than usual, as it has in some recent years.

The opening of the season will begin on noon of the first day of the season, or on the first day of each half of a split season, to permit dispersal of feeding concentrations before the guns start thudding in the marshes. Shooting will be permitted on all remaining days from one half hour before sunrise to one hour before sunset.

# CLUB NOTES

## Columbia Fish and Game Association

On June 23, this year, the brooder house of the Columbia Fish and Game Association burned. Destroyed with it were 270 thirteen-day-old pheasant chicks the club was rearing. Spirits undaunted, the Association's game committee started rebuilding immediately. Within a short time, volunteer labor and the donation of a new brooder stove and other materials from local merchants brought about a modern new brooder house.

Such active sportsman interest deserved reward. On July 7 an airplane flew from Columbia to Williamsport. Pheasant chicks were provided at the State's Loyalsock Game Farm, near Montoursville, and were flown safely back to Lancaster County to replace those lost in the fire.

The *Daily Intelligencer Journal*, Lancaster, commented that this was probably the first air transport of pheasant chicks attempted, and told: "Flying back three inquisitive chicks got loose and went wandering about inside the plane. . . . They were just interested in learning more about the mechanics of this airplane. After all, a contraption like this could save wear and tear on their wings."

## Northampton County Federation

The predator control contest sponsored by the Northampton County Federation of Sportsmen's clubs came to a close July 31, 1952 with a total of 1213 predators killed. The contest began September 1, 1951 and continued to July 31. This was the second year that a contest of this type was sponsored with a total of \$125.00 in cash being awarded to six mem-

bers securing the highest number of points.

Edgar Schweitzer, Achermanville club, won the \$50.00 first prize for his score of 3022 points including 29 foxes, 98 skunks, 119 opossums, 27 crows, 9 hawks, 1 wildcat, 13 weasels, 1 snapping turtle and 4 water snakes. George Achenbach, Belfast-Edelman club, won second prize of \$30.00 for his score of 1280 points and Louis Bartokovits, Hellertown club, received \$20.00 for his score of 160 points. Elwood Savitz, Lower Mt. Bethel club, last year's winner, won fourth prize, Ralph Crozier, Easton sixth place went to Virgil Hill, Lower Mt. Bethel club.

The total number reported was 82 red and 49 grey foxes, 496 crows, 11 hawks, 22 weasels, 207 opossums, wildcat, 324 skunks, 7 snapping turtles and 9 water snakes. No horned owl, goshawk or crow eggs were reported. The contest was open to any member of a club affiliated with county federation. Last year's total included 101 foxes, 557 crows, 7 weasels and 7 water snakes for a total of 672.

## Rolfe Sportsmen's Club

The Rolfe Beagle Club will hold their second annual A. K. C. licensed field trial on October 25-28. Rosette and ribbons will be awarded the winners in each class with thirty percent of the entry fee returned. A large turnout is expected, due to the success of the trial held last October when 101 dogs were officially listed.

## Hellertown Sportsmen's Association

A unique highlight of the Hellertown Club's August 26 meeting was a groundhog lunch served by mem-

er George Pearson. Mr. Pearson not  
only shot the "whistle-pigs," but also  
ooked them for the occasion.

### Indiana County Federation

In a cooperative endeavor the Indiana County Commissioners and the Indiana County Federation of sportsmen's Clubs get together to insure representation from their county at the Junior Sportsmen's Conservation Camp.

The County Commissioners agreed to set up a budget to finance two boys to the camp for the next three years, beginning in 1952. They held county-wide competitive examination and selected the two highest scoring boys to attend. Two alternates were also chosen.

In an interview with one of the successful candidates, the Commissioners explained that the purpose

was to give Indiana County youth an opportunity to learn first-hand from the program offered by the Sportsmen and to apply their knowledge and experience in the schools of the county.

### Ligonier H. S.

The Ligonier High School Conservation Club has taken matters into its own hands and hope to insure the attendance of at least one of their members at the Junior Sportsmen's Conservation Camp each year.

The club, with the full cooperation of the faculty members and sponsor, Roy Wilson, has provided means to accumulate funds for financing the cost at camp. A percentage of the dues and monies earned from such activities as fire fighting, tree planting and other efforts are earmarked for this purpose.

### DEFLECTION IN INCHES 3 OR 9 O'CLOCK WIND—30 MPH 12 GAUGE SHOT SHELLS

<b>Load</b>	<b>Shot Size</b>	10 yds.	<b>Distance</b>			
			20 yds.	30 yds.	40 yds.	50 yds.
3-3/4 - 1-1/4	2	1	4	9	15	23
	4	1	5	10	17	26
	5	1	5	11	18	28
	6	1	6	11	19	29
	7½	2	6	13	22	33
	4	1	5	10	17	25
3-1/4 - 1-1/8	5	1	5	11	18	27
	6	1	5	11	19	29
	8	2	6	14	22	34
	4	1	5	10	16	25
3 - 1	5	1	5	11	18	27
	6	1	5	11	19	29
	7½	2	6	12	21	33
	4	1	5	10	16	25
3-1/4 - 1-1/4	5	1	5	11	18	27
	6	1	5	11	19	28
	7½	2	6	12	21	32
3 - 1-1/8	8	2	6	13	22	34
	4	1	5	10	16	25
	5	1	5	10	18	27
	6	1	5	11	19	28
2-3/4 - 1-1/8	7½	2	6	12	21	32
	8	2	6	13	22	34
	7½	2	6	12	21	32
	8	2	6	12	22	34



Photos By The Author

L. E. Stotz, ranger at the Allegheny National Forest station at Sheffield, and Mrs. Raymond Ralston, fire weather station operator at Barnes, weigh wooden strips taken from above forest litter to see if they have given off or taken on moisture since the previous reading.

## Green Home for Game

By Marian Potter

**W**IILD LIFE in one of the state's leading game areas owes the protection of its home partly to the calculations which a busy farm woman makes at her kitchen table. She is Mrs. Raymond Ralston, opera-

tor of a fire weather station for the Allegheny Forest at Barnes, Pennsylvania.

She begins her work early in the spring when the timber is in the treacherous transitional stage of

hanging from bud to leaf. Before the forest greens, the fire hazard is great, and it is great again in the autumn when the dry leaves fall. Mrs. Ralston continues her work all through the summer until winter storms put an end to fire danger. The fire hazard often continues far into cold weather. In the 1951 deer season, hunters were still being warned to be careful of warming fires since fire could melt the light snow on the ground and light the dry leaves beneath.

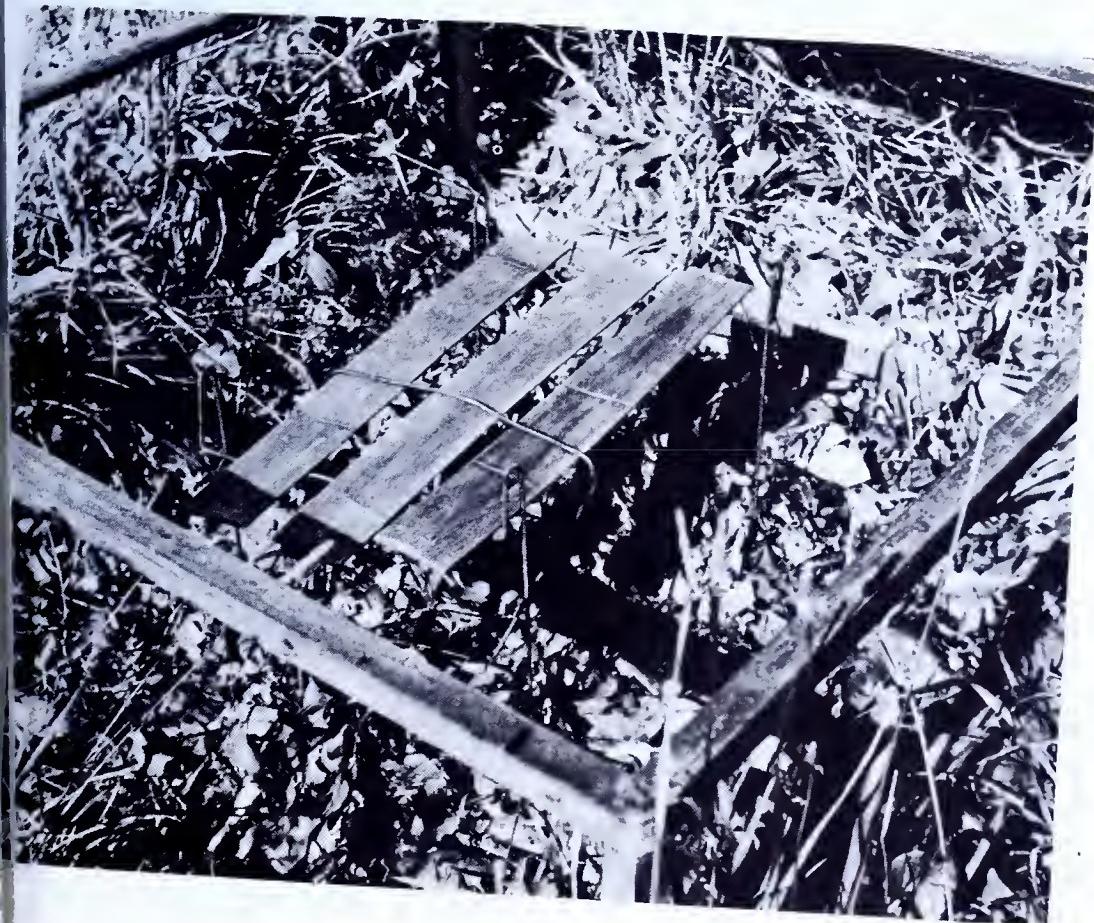
The Allegheny Forest of about three-fourths of a million acres is protected by two fire weather stations, one at Barnes and one at Marienville.

The station which Verna Ralston operates at Barnes is in the backyard of her farm home. There, layers of screen wire are placed on a hinged

frame about three-feet square. As the season advances, additional thicknesses of screen are placed on the frame, so that by the time the timber is in full leaf, the frame is covered by ten thicknesses of screen. Beneath the screened top are three light strips of bass wood held on a wire frame above a litter of leaves. Three times a day, seven days a week Verna Ralston takes these slats from their frame and weighs them on the very sensitive scale which is also a part of her weather station. The weight of the strips of wood indicates whether they are giving off or taking on moisture.

This weight gives her a key to what she calls the burnability of the forest floor, for the litter under the strips is similar to that on the forest

*The weight of these wooden strips shows the moisture content of the leaves and twigs under forest trees.*



floor. The screen is equal to the forest shade. The burnability of the forest litter is very important in calculating fire hazard, for it is in the dry leaves and twigs under the trees that fires start, not in the trees.

Of course, there are other fire factors to consider, and Mrs. Ralston checks them carefully. Visibility, state of the weather, amount of precipitation, wind direction and the state of vegetation she records. Then comes an extremely important factor in fire hazard. It is wind velocity. An anemometer is a part of her fire weather station. To check wind velocity, she turns on the electric buzzer connected with the anemometer which has rotating metal balls mounted on a high pole. From the number of times the buzzer sounds in two minutes, she determines the speed of the wind.

Then comes the summing up at the kitchen table. Mrs. Ralston uses a chart with several movable circles which she sets according to the readings she has made on the various fire factors. From the placing of these circles, she determines the burning index of the day.

That index is very important, for the entire fire protection mechanism of the vast forest functions according to it. Mrs. Ralston telephones her findings daily to Mr. Thomas Aul at the fire tower at Marienville. He receives a similar daily report there from the Marienville fire weather station and averages the two readings to determine the class of the fire day for the entire forest.

Fire protection assistants at the Forest's two ranger stations are told of the class of fire day. If it is a day of great hazard which the fall and spring sometimes bring, they have all their equipment ready for an emergency. They are in touch by portable radio with other forest workers. They know where they can get emergency crews in case of a large fire or of a number of fires at

the same time. Timber markers and other forestry workers are informed to keep in touch with fire towers and ranger stations. Each forestry worker knows what he is to do on each class of fire day. Lookout towers are manned according to the class of fire day.

Since state and federal lands join in the Allegheny Forest and since fire does not stop at a boundary line, fire protection is a joint operation for the two governments. State fire tower watchers and fire wardens are informed of fire hazard by the calculations of the federal fire weather stations.

Wildlife cannot survive in the desolation left by fire. Through careful calculations, Mrs. Ralston and her little wooden strips help keep a green home for wild game.

. . . The End



Edward L. Vollmer (above) and Joe Gray of St. Marys, really hit the jackpot on bobcats during the past deer season. In one day they each bagged a cat, besides crippling another and hearing still another.



**I**N Pennsylvania the mink ranks fourth on the list of wild fur animals considered as scarce. It is preceded by the otter, bobcat, and beaver in that order. In the category of fur value, the mink is topped only by beaver and otter.

To further give you an idea of how scarce the mink is in Pennsylvania, I checked into the official fur catch records and I found some startling revelations. For example, during the 1947-48 trapping season 10,679 minks were caught in our Commonwealth. Looking at the records of some other states which are recognized fur producers I found that during the same season 91,541 minks were caught in Louisiana, while in Minnesota 66,270 minks were caught. On the other hand however I found that in Maine, where many Pennsylvania trappers assume that trapping is ideal, I found that only 1,650 minks were caught during the same season.

Over the years, according to official records, our annual catch of minks has been pretty much on a level. Roughly we average about 10,000 minks per season. A very close study would probably reveal a slight downward trend.

Since mink furs have always commanded a fairly high price many trappers are inclined to believe that trapping pressure does not allow our mink to propagate normally to any definite extent. Then too, there are those who feel that habitat is the determining factor.

Recognized authorities as well as trappers have learned that minks eat a large variety of food, and that they are not dependent upon any parti-

## The Mink

By L. J. Kopp

cular one. Their diet includes aquatic life such as fish, crawfish, frogs, and others. In addition they relish mice and insects. It would appear natural food supplies are not the sole factor insofar as natural propagation is concerned. Rather, it would seem that trapping pressure is the major factor which helps to determine our mink population.

Suggesting stricter protection and propagation is only natural for those trappers who do not enjoy mink trapping because of the limited distribution of minks. Here again we become involved in a matter which is not fully understood. Propagation or stocking minks in depleting areas would not be a wise move for several reasons. In the first place fur animal propagation is a complicated science which has not yet been developed to the point where everyone concerned can understand it. We do not even agree on what constitutes proper habitat. In general, the public seems to be slow in approving mink propagation. One reason for this is that minks are recognized as being destructive to fish and other forms of wildlife. However, it is also understood that minks are quite omnivorous and therefore their depredation on any one food supply is questionable. The point is that fur management has not yet reached the point where everybody understands it, and as a result, any unnatural propagation would be unsound.

Experienced trappers know that minks are great travelers. A mink may travel along a stream for several miles in one night. When daybreak comes they seek shelter which could be a hollow log, an old muskrat den



or under a stream bank. Here they sleep until nightfall when they again resume their journey. It is not at all unusual for minks to travel cross country from one stream to another, since they are not strictly water animals.

This, then, is one of those things which makes mink trapping difficult. A trapper may make a mink set at a small run which empties into the larger stream, or anywhere else where mink tracks indicate a good location for a blind set, but the big question is, when will that mink make his next appearance? It may be the next night. Then too, it might be four or five nights later. The important thing, therefore, is to be patient, and see to it that your set is in good working order when the mink does put in an appearance.

Finding mink sign, particularly mink tracks, is almost as difficult as catching them. It requires experienced and well trained eyes to detect the tracks of a mink. The main reason for this is simply that minks do not leave many tracks, since they do not always follow along the edge of the stream as would a raccoon. You might find a set of mink tracks along a mud or sandbar along the stream, and it is highly possible that

you could follow along the stream for a half mile before you would again see mink tracks. Once while on a fishing trip in Northern Pennsylvania I found the tracks of a mink where it hopped across a very narrow run from an underground spring. That is all I saw, just two sets of mink tracks. As it happened I fished along that stream for quite some distance in the hope that I might find more mink signs, and I had all but concluded that the mink must have absolved into oblivion when I came to a rather wide muddy area, and there I again noted several sets of mink tracks as it crossed the muddy area. Between this spot and the place where I had first seen the tracks there were numerous places where my eyes strained to detect the tracks of the mink, but somehow the animal carefully avoided all these obvious giveaways.

There are mink trappers in Pennsylvania who are so well versed in mink trapping that they can find sign where indeed few other persons would even see it if it were right in front of their eyes. Such a trapper might reveal a mink track by simply lifting a newly fallen leaf which had settled down directly over the track. To be sure, such a trapper knows exactly where to look for sign.

Another notable feature about the mink is that they prefer to locate and kill their own meals. They prefer fresh food, in other words, and for this reason mink trappers are generally agreed that blind sets are more productive than bait sets. Since minks do not appear regularly, bait has a tendency to become stale and lose its attractiveness by the time a mink finds it.

Blind sets for mink are made under overhanging stream banks, under small bridges, or in other narrow passage ways where you think a mink is likely to pass through.

All the precautions which you observe in fox trapping also apply to

mink trapping. Traps are coated in lye and water solution to remove any odors which would warn the mink of its presence, and they are colored so that they are not readily noticeable. Traps are usually set in water, and covered with a thin layer of mud or water-soaked leaves. Naturally such sets are made while standing in the water, not from the stream bank. Enter the stream some distance above or below the place where you intend to set your trap, and wade up or down to the spot in the stream, and set the trap without in any way touching the bank with your bare hands.

Several years ago while attending trappers convention in Ohio I lis-

tened to an expert Ohio mink trapper explain that minks have not only a highly developed sense of smell, but exceptionally keen eyesight as well. Stressing the importance of avoiding un-natural odors or disturbances around mink sets, he pointed out that when a mink approaches a small bridge it will stop momentarily and survey the situation before continuing on its way. If the mink is satisfied that no danger is lurking in some dark corner under the bridge, there is a chance that you will catch him.

It would appear that the mink thinks highly of our motto; look before you leap!

. . . *The End.*

---

#### NWF ANNOUNCES HIGH SCHOOL CONTEST

The National Wildlife Federation has asked the high school students of America to create a cartoon character which can be used to tell the story of conservation—and offered prizes totaling \$700 in a nationwide contest.

The cartoon contest will take the place of the annual conservation poster contest which the Federation has sponsored for 15 years. Entries must be submitted by next Jan. 31 and winners will be announced during National Wildlife Week in March, 1953.

As in the previous poster contests, the cartoon competition will be divided into junior-high and senior-high groups. Students anywhere in the United States, from the seventh grade through the last year in high school, are eligible.

First prize in the Junior division—grades 7, 8 and 9—is \$100. The second best entry will win \$50; third, \$25; the next ten best, \$10 each.

Top winner in the Senior division—grades 10, 11 and 12—will get \$250. Second prize is \$50; third, \$25; next ten, \$10 each.

The Federation said the contest was inspired by the success of "Smokey Bear," the cartoon character developed by the U. S. Forest Service in its advertising campaign to prevent forest fires. The wildlife organization hopes to find a similar cartoon symbol which can be used to urge Americans to take care of their natural resources.

The Federation had these suggestions for young artists:

Entries may be a caricature of an animal or person, or the personification of an animal in the manner of a Disney character. It cautioned, however, against copying the style of another artist. In order to win an entry must be original in design.

The cartoon character may be depicted in an action or pose suggestive of some conservation problem or practice and should be accompanied by an appropriate legend or slogan. The theme may be soil conservation, forestry, water pollution control, flood prevention, protection of wildlife or plant life, or another phase of natural resource management.

The drawing should be done in pen and ink, pencil, charcoal, scratch-board, water color, or other standard medium suitable for reproduction in a newspaper or magazine.

For a copy of the contest rules and other information, write to the Cartoon Contest, National Wildlife Federation, 3308 Fourteenth Street, N. W., Washington 10, D. C.



By Thomas A. Forbes

## PART II

### Shots

**N**OW for the shots that make up a standard fourteen shot unit. They need not follow in the order listed in the following tabulation but each of them must be included in the fourteen target unit.

#### *One Position Shots at a 12" Face.*

Four arrows at each of four targets spaced at fifteen, twenty, twenty-five, and thirty yards respectively.

#### *One Position Shots at an 18" Face.*

Four arrows at each of four targets spaced at forty, forty-five, and fifty yards respectively.

#### *One Position Shots at a 24" Face.*

Four arrows at each of three targets spaced at fifty-five, sixty, and sixty-five yards respectively.

#### *Four Position Shots at an 18" Face.*

Four arrows. Each one to be shot from a different position but at the same distance of thirty-five yards from the target.

Four arrows. Shooting one arrow at each of the following distances: thirty, thirty-five, forty, and forty-five yards respectively.

#### *Four Position Shots at a 24" Face.*

Four arrows. Shooting one arrow at each of the following distances: fifty, sixty, seventy, and eighty yards respectively.

#### *Four Position Shots at a 6" Face.*

Four arrows. Shooting one arrow at each of the following distances: twenty, twenty-five, thirty, and thirty-five feet respectively.

The last three shots are commonly called "Walk Ups." It is customary to shoot these targets in the order of

# Construction of a Field Roving Course

decreasing yardages but it is permissible to require them to be shot in the reverse order.

Our plan has now progressed to the stage where we can select tentative sites for the individual shots. Bear in mind the various changes in topography you have marked in exploring your site and make your layout of shots so that they are hard to estimate for distance. An intervening rise in the ground between the shooting position and the target is one example of a shot where it is difficult to estimate the yardage. Avoid long shots up a steep hillside. If you desire a shot at a high angle keep the yardage short and build an easy winding trail to the target from the shooting position. A slight difference in elevation between the shooting position and the target on long shots will prove quite deceptive as the shooter will not be conscious of the change in elevation.

All shots should be selected and marked before any construction is undertaken. Take two pieces of cloth one white and the other colored. Tear them into long narrow strips. When you have selected a site for a shot tie a white strip on a limb or bush at the shooting position and a colored strip at the site of the target. Continue in this manner until all the shots have been laid out on the ground. At this stage changes and adjustments can be made until you have a satisfactory unit layout and no actual labor will be lost.

## Trails

The next step is to blaze the trails. Keep to a uniform easy grade and bring each trail to the rear of its respective shooting position. This adds safety feature to your layout. A trail which parallels a flight line of a shot is dangerous as arrows may be deflected from the line of flight to the target by striking twigs or leaves and endanger those walking on the trail. The trails should be constructed so that they are smooth, wide, and free from rocks or obstructions which provide an insecure footing. A difficult trail annoys the shooter and prevents conversation. Is there an archer who does not enjoy a post mortum as he moves toward the next shooting position?

## Construction

Our layout is fixed on the ground and we proceed to the actual construction work. All travel on the course should follow the blazed trails and as work progresses from shot to shot the trail will be improved at the same time by use.

Clean the necessary areas at the shooting position and at the target. On the flight line remove only those obstacles which prevent a clear view of the target or would obstruct an arrow as it rises and falls on its line of flight to the target.

Paint shooting pegs white and print the number of the shot on the shooting peg on the side facing the archer as he approaches the shooting

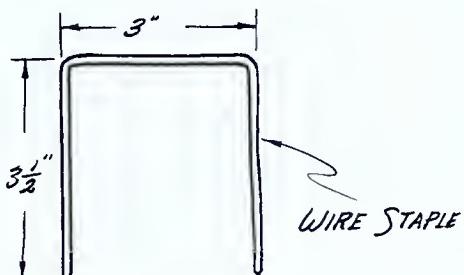


Fig. 22

position along the trail. On four position shots designate the order in which the shooting is to be done by adding additional numbers one, two, three, and four to their respective shooting pegs. For example, Figure 20 indicates the fourth shot in the unit and the peg from which your second arrow is shot.

## Butts

In sections of the state where a crop of rye is grown, the three wire bale of rye straw made by a stationary bailer can generally be obtained. This is the most satisfactory type of baled straw to use for your butts. Each bale will weigh approximately one hundred pounds. The arrows will penetrate well but will not pass through the bale. The straw is well compacted in the bale and weathers well. Use one bale of straw for six inch and twelve inch targets, two bales for 18 inch targets, and three bales for the twenty-four inch targets. See Figure 21.

Place the bales in position on top of old auto casings with the bales' wires on the top and bottom of the bales. Add a tar roofing paper cover for protection from the elements and wire all three bales firmly together with wire. The old casings serve two purposes. They preserve the bottom bale from rot which would occur if the bale was in contact with the ground. Second; Arrows which undershot the target will rebound without injury from the rubber casings. Without these casings arrows will fre-

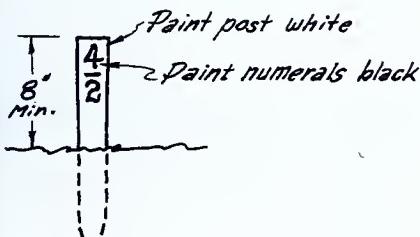


Fig. 20  
SHOOTING POST

quently slip out of sight between the bottom bale and the ground. If not lost at least the fletching will be water soaked from contact with the damp straw at the bottom of the stack of bales and the arrows flight will be effected. Drive at least two posts firmly into the ground at the back of the stack of baled straw and wire the butt to them. This precaution is necessary to prevent arrows being broken if the butt is accidentally tipped over while arrows are drawn from the target or by the wind or other causes while arrows are in the target.

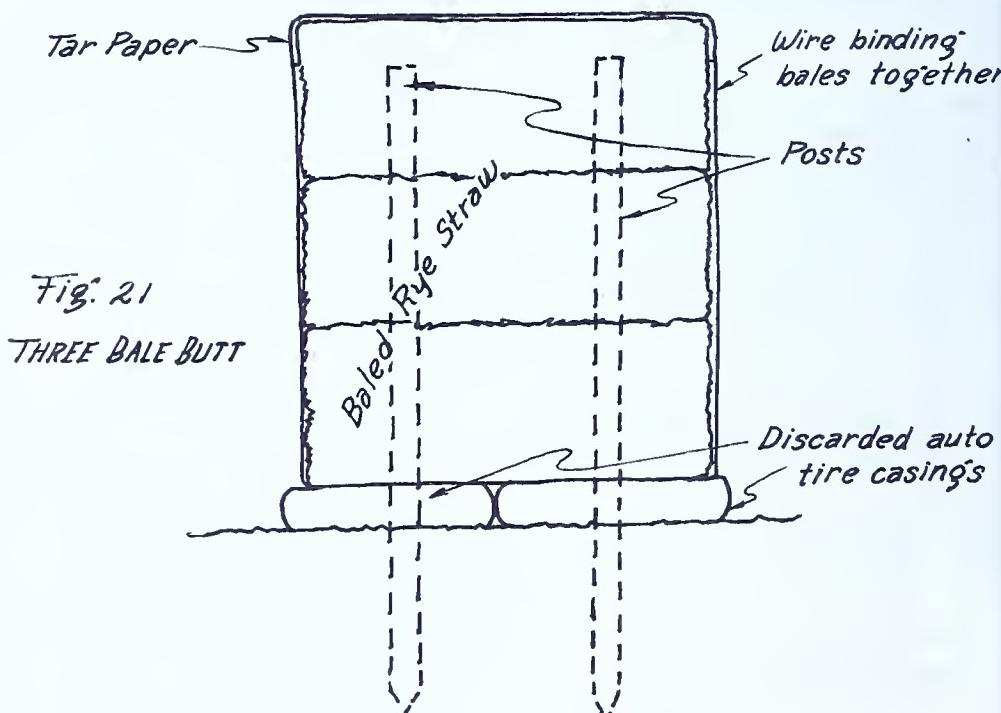
### Faces

Several types of faces may be purchased or you can make your own. Animal silhouettes are frequently superimposed on the standard faces and provide an interesting target. Each face has an aiming spot in the center of the bull and in addition an outer scoring ring. There are four official face sizes and the shots on which each size is used are listed elsewhere in this article.

The twenty-four inch face has a twelve inch center bull and a four inch aiming spot; The eighteen inch face, a nine inch center bull and a three inch aiming spot; the twelve inch face, a six inch center bull and a two inch aiming spot; and the six inch face has a three inch center bull and a one inch aiming spot. To obtain the maximum amount of use from one set of faces it is customary to glue the faces to a backing made from sections of cardboard cut from shipping cartons. The faces are fixed to the butt with large wire staples which can be made from ordinary wire clothes hangers. See Figure No 22.

Plan your course wisely. If you insist on building a rugged course where old clothes and spiked boots are necessary to negotiate the trails and two rounds on a summer day exhausts even the hardy he men of your club it will not be long until the grassgrows in the trails again. Even the hardy will do more talking about their course than shooting over it.

. . . The End.



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# 1952 Pennsylvania Open Seasons for Waterfowl and Other Migratory Game Birds Under Federal and State Regulations

SPECIES	OPEN SEASONS		DAILY BAG LIMITS	MAXIMUM POSSESSION LIMITS*	LEGAL SHOOTING DAYS & HOURS (SUNDAYS EXCEPTED)	
	FIRST DAY	LAST DAY			BOTH DATES INCL.	HOURS (EASTERN STANDARD TIME)
Sora	Sept. 1	Oct. 30	25	25	Sept. 1 to Oct. 19 Oct. 20 to Oct. 30	... $\frac{1}{2}$ hr. before sunrise to sunset $\frac{1}{2}$ hr. before sunrise to 1 hr. before sunset
Rails (except Sora) and Gallinules	Sept. 1	Oct. 30	15	15	Sept. 1 to Oct. 19 Oct. 20 to Oct. 30	... $\frac{1}{2}$ hr. before sunrise to sunset $\frac{1}{2}$ hr. before sunrise to 1 hr. before sunset
Woodcock	Oct. 15	Nov. 14	4	8	Oct. 15 to Oct. 31 Nov. 1 only Nov. 2 to Nov. 14	... $\frac{1}{2}$ hr. before sunrise to sunset 9:00 a.m. to sunset $\frac{1}{2}$ hr. before sunrise to sunset
Doves	Sept. 15	Oct. 14	8	8	Sept. 15 to Oct. 14	12:00 Noon to sunset
Ducks (except American and Red-breasted Mergansers)	Oct. 20	Dec. 13	4 (only 1 wood duck)	8 (only 1 wood duck) (any number after first day)	Oct. 20 only Nov. 1 only	12:00 Noon to 1 hr. before sunset 9:00 a.m. to 1 hr. before sunset
American and Red-breasted Mergansers	Oct. 20	Dec. 13	25	3••	All Other Days of Open Season— $\frac{1}{2}$ hr. before sunrise to 1 hr. before sunset	
Geece (except Snow)	Oct. 20	Dec. 13	3••			
Coots	Oct. 20	Dec. 13	10	10		
Brant	Oct. 20	Nov. 3	3	3		
<b>NO OPEN SEASON</b> —Wilson's Snipe (Jacksnipe), Snow Geese, and Swans.						

\* Possession 90 days after close of season where taken.

\*\* The daily bag must not contain more than three Canada Geese, but may in addition include three Blue Geese which is also maximum possession limit.

## MIGRATORY BIRD HUNTING METHODS

**Permitted:** Shotgun only, not larger than 10-gauge, fired from shoulder (including hand-operated and semi-automatic repeating shotgun of not more than 3-shell capacity, which must be plugged to 3 shots so that plug cannot be removed without disassembling the gun); dog; blind; boat propelled by hand; floating device other than sinkbox; artificial decoys. Injured or dead waterfowl may be picked up by means of a motorboat; sailboat or other craft. This year shooting is permitted from a boat or other craft having a motor attached if such craft is fastened within or tied immediately alongside of any type of stationary hunting blind.

**Prohibited:** All rifles; live duck or goose decoys; automobile; aircraft; sinkbox

any place where salt or shelled, shucked, or unshucked corn, wheat, or other grains, or other feed of similar use in attracting such birds is placed, exposed, deposited, distributed, scattered, or present at any time during or within two weeks prior to the open season on such birds. In addition, such birds may not be taken under any circumstances by the aid of salt, or shelled, shucked, or unshucked corn, wheat, or other grains, or other feed similarly used to lure, attract, or entice such birds, to, on, or over the area where hunters are attempting to take them. Water fowl may not be taken by means, aid or use of cattle, horses or mules and no motor-driven land, water or air conveyance or sailboat may be used to concentrate, drive, rally or stir up waterfowl or coots.

## FEDERAL STAMP FOR MIGRATORY BIRD HUNTING

It is unlawful for a person over the age of 16 years to take migratory waterfowl unless he carries on his person an unexpired Federal migratory bird-hunting stamp, validated by his signature written in ink across its face. Not valid after

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# Game News



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# THE STORY BEHIND THE COVER

SHOULD the cottontail suddenly disappear from the sporting scene it's a sure bet that a goodly portion of our gunners would neglect buying a hunting license the following year for Br'er Rabbit is far and away the favorite game of Pennsylvania hunters. He and his kind are bagged to the tune of more than one million per season—in fact, during some seasons the kill has exceeded the three million mark.

Br'er Rabbit has always been popular. Ever since the first fields were carved out of Penn's Woods, men and dogs have beat the weeds and briars in search of succulent rabbit dinners. Many a fine old Lancaster flintlock rifle was bored out for shot, as the cottontail superseded the whitetail. To Grandpa, in the late 1800's, the words "hunting" and "rabbit" were practically synonymous. His pride and joy, that sleek, new breechloader with its twist steel barrels and visible hammers, was ordered expressly for rabbit hunting.

And so it goes, down through the years. Here we are in 1952, and Br'e Rabbit still leads the hit parade. The vast majority of Pennsylvania's hunter would no more think of missing the first day of rabbit season than they would of giving away their best beagle, and during the month of November every pool room, barber shop and general store rings with enthusiastic recounts of the day's hunt, complete with sound effects.

Keeping the hunters of the state supplied with cottontails has been a major problem for the Game Commission. Years ago natural propagation managed to keep pace with the demand, but clean farming and an increased number of hunters changed all that. Where once stump or worm fence separated fields with a ten foot brushy swath, we now find single strand electric fences under which nothing can hide. Where in the old days the farmer's family and a few good friends trudged through the fields in search of the bouncing bunny, we now find a hundred or more eager nimrod trampling the stubble in the course of a season.

To keep enough game in clean farmed fields to satisfy one million hunter is quite a challenge, but the Commission feels it has the answer in food and cover improvement. Contrary to popular belief sufficient breeding stock usually remains after each small game season, and the failure of these rabbits to survive and re-populate their coverts is due almost entirely to an inadequate food supply, unsuitable cover, or a combination of both. Experience has shown that correcting these conditions can bring about some surprising results—in some instances populations have actually been tripled in three years despite of extremely heavy hunting. With a good degree of success crowned practically every project of this type, habitat improvement appears to be the only permanent solution to furnishing *more* rabbits for *more* hunters.

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## Cover Kodachrome

by

Ralph M. Cady

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# Thanksgiving Today

ON the first Thanksgiving Day the Pilgrims celebrated a bountiful harvest and offered thanks to the Almighty for unfettered freedom in a new land where they found many of the necessities of life merely for the taking.

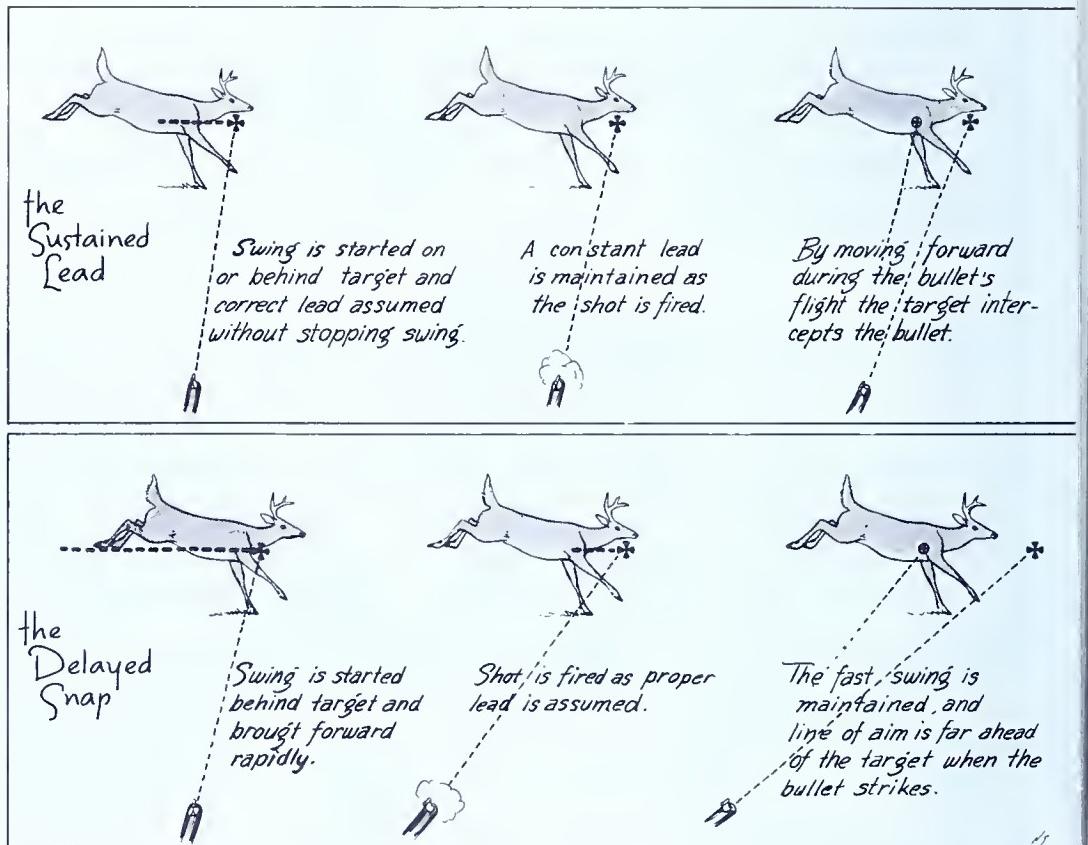
Certainly there were dangers and hardships to be met, but the founding fathers were too hardy and too inspired to be easily discouraged. In the land of their adoption there was timber for homes and fuel, fertile soil for crops and a seemingly limitless supply of wildlife for food and clothing.

Through the years the Day of Thanks has continued to be one of feasting and reunion, but the holiday of plenty has lost much of its original significance. Many generations have lived well in this land since then and have come to consider the best living conditions in the world as their natural, never-changing right. Gone is the intrepid pioneer zeal, and gone are the dangers the early settlers faced in a wilderness America. Dwindled, too, are the vast resource reservoirs with which Nature had blessed this continent—resources undreamed of and hardly tapped by the early whites. These were the elements that formed the basis of a modern nation's unparalleled prosperity and industrial might. They supplied the implements of war and fighting men preserved our freedom whenever our existence was threatened.

Today we are an envied nation, a rich prize for any conqueror. The red men the pioneers found here were different from the reds we encounter today. The new menace threatens from without, as it undermines and demoralizes from within.

Grave danger lies in the wanton destruction of our natural resources. Some of these riches have reached an alarming low. Our waste of top soil, timber, minerals and other natural resources, along with water pollution and its attendant ills, have forced the realization that the country's resources are not limitless, that their continued misuse and waste will weaken us to the extent we may in time be overpowered, as other great nations were in the past.

Along with conservation agencies striving to preserve this nation through the wise and careful use of wealth-and power-producing resources, is an ever-increasing number of outdoors men and women. They have learned through their contacts with Nature that though the best things in life are free, freedom carries with it many responsibilities, and they combat at every turn the misuse and waste of resources. They learned first that good hunting and fishing are bi-products of sound soil management and pure waters; then later became conscious of the national peril inherent in the sins of resource abuse. The conservation-minded want their children and future generations to live in the land of opportunity, able to thank the Creator as the Pilgrims did, on that first Thanksgiving Day, for blessings not found elsewhere—and for all the things that give us the strength to remain a free nation under God.



## *When You Have to Shoot 'Em Runnin'*

By Ed Shearer

WHETHER you like it or not, there are times when you must take a shot at running game if you yearn for wild meat on your plate. And if you shudder at the idea you probably belong to the great majority who start smoking up the scenery at the game's first appearance and who work industriously at said smoking until it disappears over the far horizon. They firmly believe along with some of our military authorities, that if you fill the atmosphere with a sufficient quantity of lead something is

bound to run into it. They are a great boon to the ammunition manufacturers.

I believe the chief difficulty the average hunter encounters in hitting moving game is lack of understanding of the factors he must overcome before he can expect results. There are many differences between shooting targets on the rifle range or a chuck in a clover field and deer in the mountains.

The range shooter is shooting over known ranges with a set of conditions

that are fairly constant to give him as much opportunity on the last shot as on the first.

The chuck hunter is not so well off, as his first shot is generally his last one. But to offset this he usually has time to assume the best position and estimate conditions.

But the deer hunter, when his game is running, has none of these advantages, and there are three cardinal rules the deer hunter must keep in mind if he has an aversion to canned meat.

Nine times out of ten his first shot is his best shot—there is no argument about that. I honestly believe that more shots are bungled, even on running game, by shooting too quickly than shooting too slow. The beginner should forget that there are a lot more cartridges in the magazine; it is the cartridge in the barrel that counts. Many times I have watched a deer coming running toward a hunter and have him try to blast said deer pronto with no results when by holding his fire he could have had an easy shot at fifteen yards.

Take the time three of us were spread out cat-footing it over a flat which edged into a big swale. Suddenly the rifles started to bark. Looking up the edge of the flat I sighted my two companions standing up and fanning lead across the swale.

Then I saw him—a really good buck running down the side of the swale giving me a crossing shot at about one hundred and fifty yards. I was shooting a model 70 Winchester with a sling. Hurriedly I jammed my arm through the sling and the seat of my pants hit the ground giving me a solid shooting position. The sights picked up the buck, swing on and ahead of him as I squeezed the trigger. Down he went!

Just another case of, "your first shot is your best shot." My companions were both good shots and

had killed plenty of deer. But in trying to beat each other to the buck they pinned their faith on fast off-hand shooting at that distance while I sat down and gambled everything on one good shot and picked up the marbles.

That is a point to keep in mind in connection with your first shot. It is only as good as YOU take advantage of conditions. Kneel, sit or lie prone if conditions permit regardless of what Daniel Boone may say. You're out to kill a deer not to put on a fancy shooting exhibition and the deer don't give a hoot whether you're sittin or standing on your head.

The second rule is to shoot with both eyes open. Anybody can do it or learn it; the only requirement is that you must have two eyes. You will never be much of a success on running game until you do. With both eyes open the master eye lines up the sights with the game, while the other sees the field of view surrounding it. This method is not only lightning fast but allows you to pick open places to get your bullet through while swinging your gun with the game, which you must do if you want to connect, a big advantage in the brush and pole stage timber which we have in the East.

The third and most important point, probably because it's a mental hazard is, "They are seldom running as fast as they appear." I firmly believe that a great many hunters are stampeded out of their natural ability to shoot well by this illusion of speed, which makes them think in terms of split seconds than any other cause. This I think is further fostered by published stories of automobiles going sixty miles an hour with the deer saying, "How de do," to the driver every third jump. All that I can say in light of certain facts is that the deer must have had the advantage of a terrific tail wind.

I first began to get some insight on this deer speed business when I was in the Forest Service. At that time the Pennsylvania deer herd was at its peak. On a summer's evening an hour's stroll from camp would show you from fifteen to fifty deer.

To keep my hand in I used to take the .33 Winchester which was a very fine-pointing and smooth-working rifle along. The first thing that impressed me was the amount of time I had to get the sights on them, pull the trigger, work the action and pull again, with the empty gun. It pointed up the illusion of speed caused by mental excitement which led to hurried and bad shooting on running deer.

Talking it over later with a shooting pal who was a born experimenter and deer hunter we decided to investigate further. So armed with a stop watch that was accurate to one-tenth second, we hied ourselves to camp. Our plan was simple. If the deer was not running we scared him and the time was taken between trees or other land marks and the distance measured. The mechanics employed on a check showed no greater error than five per cent.

We found that the average speed of a running deer was between fifteen and twenty miles an hour. Even when shots were fired to scare them the speed never rose to more than twenty or twenty-five miles an hour. The lone exception was a forked horn buck who put his head down and fanned it out of the country at the rate of thirty miles an hour.

Now this does not mean that a whitetail cannot run faster, because under some special conditions they can do considerably better. But the average speed that the hunter will encounter will be between fifteen and twenty-five miles an hour.

Now that brings up the question of how far must I lead or hold ahead of a deer to hit him. First let us

clearly understand the factors involved. The lead factor varies with the rifle or cartridge you are using, with the speed of the game you are shooting at and the range.

For example, the higher the velocity of your bullet; the shorter the range, the slower the speed of the game; the less lead you will need. Another factor is the direction the game is going. A crossing or right angle shot takes the most lead and progressively decreases with the decrease of the angle. A straight away shot will obviously require no lead at all.

From the pure arithmetic we find this. Suppose you are shooting at a deer two hundred yards distant with a .30-06 Springfield rifle. He is running across in front of you at right angles at a speed of thirty miles an hour. The ballistic table tells us it takes about one-quarter of a second for the bullet to amble two hundred yards. At thirty miles per hour our desired venison is leaving the country at the rate of 44 feet per second. So in that quarter of a second our deer will travel eleven feet which will be the distance you will have to hold ahead of him for a shoulder shot.

Let us take a shot nearer the average and see what happens. Say the deer is one hundred yards and running fifteen miles per hour, with the same .30-06 load. Here we find that the bullet requires about .12 seconds to travel one hundred yards. At fifteen miles per hour the deer is moving 22 feet per second. Thus the deer roughly has traveled two and one-half feet while the bullet is traveling one hundred yard which is how far you must hold ahead. Now this lead, according to rifle used, is the actual ballistic distance you must make up some way if you kill your deer. There is another joker which further complicates matters is human reaction time or how long it takes to get the shot.

away after you have made up your mind to shoot. One of our Arms companies ran some exhaustive laboratory tests to determine this human reaction time.

They gave the man being tested a gun which was connected to various electronic instruments by wires. They placed a light bulb in front of him at which he aimed the gun. When the light flashed on he pulled the trigger. These devices measured the time from when the light flashed on to when the trigger was pulled. The time that elapsed from the eyes receiving the message, transmitting it to the brain and the brain's passing it down through the muscular and nerve channels to the actual pulling of the trigger added up to about one quarter of a second, on the average.

Now add this time to the bullet flight time it takes to travel two hundred yards and you have a half a second, during which the deer has doubled the distance traveled. By this time the average hunter is getting slightly dizzy and says to himself, "How in the devil am I goin' to figure all that with a buck leaving me in a hurry." Fortunately the greatest value of the ballistic figures is to impress on the hunter the fact that he must lead his game, running or flying, if he expects to hit them.

This brings us to the question of actual versus apparent lead, and the mechanics used in employing them. There are three recognized methods of using lead and we will discuss each in turn.

First—the jerk and pull method. In this school of thought the hunter points his gun at what he thinks is the right distance ahead of the game and pulls the trigger, hoping the game will run into it. Under this method is the hunter who points his gun in an open spot and pulls the trigger when the deer jumps into it. This method has been handed down

to us by the old timers who were deliberate aimers rather than gun swingers, and who usually shot with one eye closed. This method not only calls for long experience but perfect timing far beyond the ability of the average hunter.

There are two other methods which are vastly better and far easier to master. The first has been called the sustained lead. This I believe was the development of duck hunters and all the old market hunters used it. In this method the hunter swings the sights from behind



or on the deer, swinging ahead until he picks up the right lead and holds it, keeping the gun moving while he presses the trigger. Any stopping or slowing down of the speed of your gun barrel means grief, and plenty of it. The swing must be smooth and even and you must follow through much the same as a batter hits a baseball. The chief advantage of this method is that it eliminates reaction time as a factor.

This is a pretty good method far less difficult to master, but you must teach yourself two things—to follow through and to estimate the amount of lead necessary on the particular game you are shooting. It's the only method I know of that will allow you to use game speeds and bullet or shot flight time.

The drawbacks are it tends to make you a bit slow when fast smooth gun handling is called for. Another thing you must guard against is trigger pull. When the setup is just right to the eye, with swing and lead perfect the temptation to yank the trigger is great. If you do you'll be eatin' beans in camp that night.

The best method is the one perfected by the grouse hunters, and once mastered is the most effective on fast shots in heavy cover. It has been called by many names over the years, but I think the best definition is the one the late Major Chas. Askins gave it many years ago, the delayed snap. It differs materially from the true snap shot. The true snap shot depended primarily on a perfect stock fit and very little, if any, aim. This is not so good on deer with a rifle.

In the delayed snap there is a definite aim taken as the gun swing is made. The technique this hunter employs is to swing his gun muzzle from behind his game, at much greater speed and presses the trigger as the muzzle passes the game. There

is a definite interval of conscious aim as the trigger is pressed.

The great value of this method is that you not only eliminate human reaction time but you make it work for you. Also you do away with the mental arithmetic problem of lead while getting the shot away. His gun is swinging faster than the game and the quarter of a second it takes him to press the trigger will allow the gun muzzle to swing considerably ahead of the game, taking care of the lead almost automatically. The shooter who uses this method will tell you he doesn't lead his game and he is right as far as *apparent* lead is concerned. But he is leading his game just the same as the hunter who aims ahead.

The advantages of this method are: (1) you can get away an aimed shot in a hurry when you are in thick cover with few openings, as the method is built on fast gun handling; (2) because the swing is fast and smooth it eliminates most of the tendency to yank the trigger and it makes you keep both eyes open—a one-eyed shooter stands a small chance of using this method successfully. The chief drawback is that it takes good co-ordination and timing, which means plenty of practice.

The head on and straightaway shots on deer are much the easiest. You must remember to hold low on that white patch on a straightaway as about two-thirds of it is tail. The lead on quartering shots will vary according to the angle.

The one joker on this lead question is the variation in reaction time of individuals, which will vary even with the same individual according to whether he is fresh, tired, sick or well, taken by surprise, or a number of other conditions. As this human reaction time will equal or exceed the arithmetic lead it is impossible to tell any shooter how

much his individual lead must be, no matter what method of gun pointing he elects to use. Personally, having done much grouse shooting I use the delayed snap up to about one hundred yards and the sustained lead over that, if I can see the game clearly, it works well for me but it is up to everybody to pick their own method.

I have heard and read of several different methods of learning running shooting, from rolling stones down a side hill to automobile hub caps on passing cars. They all lack the one vital fundamental of forming a correct picture in the mind of the shooter when actually shooting on a live deer.

The best and most simple way is to construct a running deer target. It can be homemade or store-bought. Most rifle clubs have one so look around in your home town. This gives the aspiring shooter something definite and concrete to go on. In the first place the target, being a life-size replica of a deer, can be used to estimate lead in actual deer lengths, which is easy to remember.

Second, it is easy to adjust the speed of the deer target to the actual average deer speed in the woods by means of weights.

Third, by judiciously choosing his background he can quickly check his errors of lead by dust puffs at all ranges. The important feature is that a summer of practice has formed a sight picture in his mind of just how things should look over a gun barrel, reducing to a minimum his chances of getting excited and throwing a lot of hasty shots when his big moment arrives.

The truth of the matter is that shooting running game is no more difficult than becoming a good wing shot, a good pistol shot or excelling in any other branch of the shooting game. What it does require is plenty of practice if you want to be

good. If you are not prepared to do this you might just as well make up your mind to find a *standing* deer.

. . . *The End*

**STATEMENT OF THE OWNERSHIP, MANAGEMENT, AND CIRCULATION REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39,**

United States Code, Section 233) Of PENNSYLVANIA GAME NEWS, published bi-monthly in September and March, monthly in all other months, at Harrisburg, Pennsylvania for 1952.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Commonwealth of Pennsylvania, Pennsylvania Game Commission, Harrisburg, Pa. Editor, Willard T. Johns, Jr., (On Military Leave). Managing editor-Acting editor, E. Stanley Smith, Harrisburg, Pa. Business manager.

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semi-weekly, and tri-weekly newspapers only.)

E. STANLEY SMITH.  
Sworn to and subscribed before me this  
27th day of September, 1952.

(Seal). BLAINE G. WALTER,  
Notary Public.  
(My commission expires January 7, 1955).



# Outdoor Reveries

By JOHN H. DAY

## *Outdoorsman's Harvest*

A THREE-QUARTER moon bathed the hills in pale effulgence. We unhooked the dogs from the rear of the pickup truck, slid the bar on the barnyard gate and stepped into the dim and salitary loveliness of the enchanted world of the November night. The rangy coon hounds, Hunter and Topsy, coursed wide through the pastured bottom, disturbing the quiet routine of some big Black Angus steers. Those hulking fellows, moving about in the moon glow, took on a strange and fearsome aspect.

We put the spark to our carbide cap lamps and moseyed across the pasture toward the tremendous slab pile which decorated the neighboring hillside. This pile is a favorite rendezvous of raccoons and foxes and other wild nocturnal prowlers. A nearby corn field adds to the chances of starting a coon hereabouts and we feel confident of a good chase.

Apparently the moonlight was too bright for the ring-tails, who were staying high up and safe until the black curtain of total darkness dropped across the hills. We found comfortable seats while the dogs worked hard at untangling some old trails. Now and then a tentative



bugling bay would shatter the stillness but there was no assurance in this trail talk and soon the hounds came in to report that business was bad.

We had just discovered some fallen apples with a delicious tangy taste when Hunter ran into an argument with a skunk. When a good coon dog is ranging for a trail he pays no attention to anything else. Hunter just naturally ran over that skunk, which was a bad error of judgment.

Skunks have a peculiar temperament. They don't like to be run over by anyone and are quick to assert their displeasure. Hunter came in completely saturated with attar-de-skunk. He groveled around in the grass, rubbing his head in the dirt to erase the sickening odor. In a few moments he was ready to go again

but we hunted the rest of the night in an aura of skunk perfume.

We crossed back through the pasture and took to the wooded slopes, pausing long enough to watch the fog slowly forming and weaving a gray blanket over the meadow. In these low spots the fog seems to live. The pearly sheen of the moonlight pictured it as some fairy fabric woven and fulled by unseen hands that shifted it hither and thither on the meadow loom.

Now and then a wraithlike form rose out of the mists, to grow in size and symmetry and suddenly steal away. At other times these adventuresome bits of cloud stuff would lose their nerve and sink back into the thickening mass. The poet sings of the fog moving "on little cat feet." Actually the whole fog bank moves with the relaxed sinuous grace of the feline folk.

Over the wooded rise we followed the eager dogs, crossing several line fences and finally getting into some sizable timber. Our passage set up a continual grumbling in the fallen leaves but when we halted the silence of the night closed in. We heard one night bird cry—a note new to me which I could not identify.

This area maintains a healthy population of flying squirrels. Our lights probably attracted these beautiful little soft-furred creatures, for we heard them squeaking all about in the trees. They are almost completely nocturnal, frisking about in wide-eyed enjoyment of a life marred only by the sudden silent strike of the hunting owl. I recommend the flying squirrel as good company in the midnight woods.

Our hunting luck started out bad and stayed bad. The dogs worked like veterans, but when the coon refuses to come down and spread his flat feet over the countryside the best thing to do is head for home. Hunter announced one good trail but a moment later his muffled bark signaled

that the ringtail had gone into the ground, and like a well trained hound he came away immediately.

In a final try for a trail we worked along the edge of an upland corn field. The moon was still hanging in the cloudless sky, and the shocked corn stood clearly revealed in long rows across the hillside.

Somewhere in the tall trees close by a coon stirred, aroused by the noise and the lights moving below. He cocked one wise eye at the revealing moon above and another at the noisy parade below, and turned over for another snooze before his pre-dawn breakfast ramble. I don't blame him.

Halloweeners have been at their fun-making in the open woodland edgings during the past week. Costumed in luminous yellow mummer's garb, they have set the underwoods aglow. The countryman, entranced by all this fresh loveliness in the very teeth of the blighting breath of approaching Winter, finds himself roughly used by the impish pranksters. As he comes within range of their tiny hidden cannon, they touch off round after round of miniature grape and canister. These flying pellets can really sting when caught fair on the cheek at close range.

All this hob-goblin witchery is devised by a real woodland sorcerer—the witch-hazel. One of our most common wayside shrubs, it fills in bare places in the timberlands with interesting undergrowth and displays a perverseness for changing the usual order of things. Not until the Spring and Summer have passed and its frost-bitten leaves have fallen, does it reveal its odd strap-like yellow flowers.

It seems to have dedicated itself to bestowing gladness on the dying year. The countryman notes its cool fragrance along the bushy lanes and margins of the woods. It boasts the distinction of being the only little tree of our wayside to produce its

flowers and its ripened fruit at the same time.

As an artillerist the witch-hazel performs only during the Halloween season. The seed pods of last year's flowers are now ripe and ready. Each contains two shiny brown seeds with a white tip. If seen when the husks are opening, these atomic fruits bear an odd resemblance to a grotesque monkey-like face with staring eyes.

While the waving pennants of the golden blooms swing out from thousands of gray twigs in the thickets, and the underwoods are lit up with the yellow halo from these myriads of fringy petals, the zero hour approaches for each tiny gunner to fire his round in the battle to perpetuate the species. Under the right combination of frost and sun the seed cups contract with such force as to propel their tiny missiles as far as twenty feet.

The countryman sits quietly among the little trees on a sunny day and hears the dry leaves rattle with the continual bombardment. Rivaling the golden forsythia of earliest Springtime, the witch-hazel is just now in all its glory in the Autumn woodlands. The dying year goes down with banners flying and guns booming to the last wherever the little witch-hazel is on the firing line.

The witchery of the Halloween pranksters is not confined to golden flummery and trick shots. "Water witches" use dousing forks made from the proper twig of this oversize shrub. It has to be a forked twig whose Y stands north and south, for the rising and setting suns must have sent their rays through its prongs as it grew. Many an old timer still divines the proper spot where his neighbor should sink his well.

I parked the car close by a huge brushpile and followed the trace of an old logging road back into the hill country. A brisk breeze combed through the thickets, keeping the brown banners of November con-

stantly aflutter. From the sun-warmed litter on the pathway a belated grasshopper clattered up on tiring wings and blundered down in a patch of faded goldenrod. A row of gray, weatherbeaten boulders sauntered along to the left, scrawling their craggy signatures across the page of time.

The pathway I followed was once a real roadway, that ran between a long-vanished homestead high on the slope and the main thoroughfare through that historic countryside. A few stubborn clumps of daffodil and some tag ends of lilac still mount guard by the ancient cellar hole. Somehow a road once traveled never has an end. Grasping woods and creeping meadow grass cannot disguise the fact that vanished wheels once made this track.

I walked out onto the circling ridge which throws its protecting arm about the timberland far below. As I reached the edge and looked down three white tails went up in quick alarm and a trio of deer bounded gracefully down across an old-field area and up the other side, halting in the cover of a sumac patch to check my further intentions.

A large doe and two smaller deer made up this party, perhaps a mother and twin fawns now well grown. They had been dining on fallen apples beneath the gnarled remains of the homestead orchard, and the wind had not betrayed me until I came upon them at forty paces. Behind the ruddy screen of the stag-horn sumac they turned this way and that, their inquisitive nostrils flaring wide as they weighed the news which rode the breeze.

Apparently this news was bad, for they broke nervously across the ridge, dropping out of sight on a circling course to my left. I made a quick sortie to intercept, hoping to watch their magnificent grace in full flight, but they fooled me, having apparently leaped the barbed wire fence

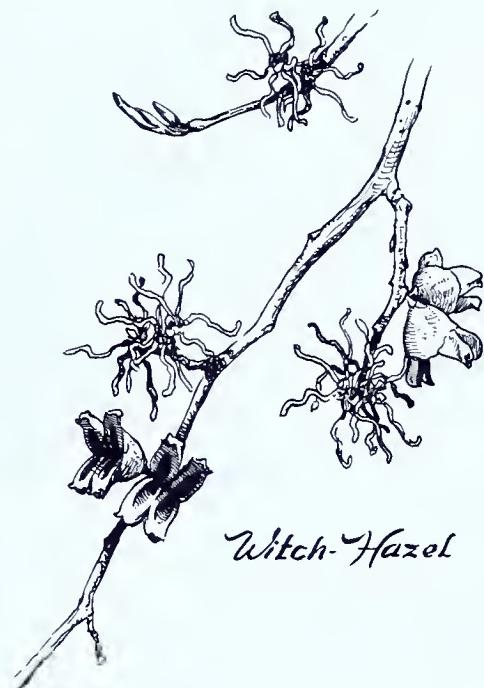
and cut into timbered cover on the neighboring farm.

A chipmunk chirped derisively as I turned back from the fruitless stalk. I tossed an apple at him and he went below decks in an indignant hurry. For a moment the wind dropped and I was conscious of the fiddling of a lone cricket, bravely sawing away despite the lateness of the hour.

I walked around the ridge, striking into the timberland at a point where the remains of a stone chimney mark the site of a pioneer cabin. A fat woodchuck waddled slowly downstairs as I neared his apartment. In the creek bottom flats which drain the area there was a late hatch of midges. They danced in the November sunlight just as spryly as the great smoky clouds which hummed above our sidewalks in August.

Down on the forest floor the brown leaves were in a torment of activity. As the wind called the tune whirling dervish dances drove through the trees. There were sudden scurrying here and there as the leaves rushed about, rallying to favorite sons in the frolicsome convention of the November woodland. Amid all this joyful hullabaloo I tripped awkwardly over an exposed root, and fell flat on my face with a crash landing which silenced the timberland and panicked a herd of black Angus cattle on a far hillside.

As November's sands run out the countryman lifts up his eyes to the strengthening hills and counts thankfully his many blessings. Now the harvest is in. Now every crib and every mow, bursting at the seams, mark once more the season for thanksgiving. Red-cheeked apples lie on the cellar floor. Golden pumpkins await the chopping knife. Cattle are now free to forage through the rustling corn rows. The hustle and bustle of the Summer is over and now a man can relax, and take stock, and thank his Maker for the year's rich harvest.



*Witch-Hazel*

The outdoorsman reaps a different harvest, but is no less fervent in his thanksgiving. He counts his wealth in gladness of the soul. Moths cannot corrupt, nor thieves break through and steal the grist of many delightful days afield, angling or berrying or just plain loafing along the wayside trails.

His is the sun, and all its glory. The veery at the swamp's edge, just at twilight. His is the grandeur of the wide night sky with its untold stars. The favorite footpath through the wooded valley. The exciting scents the breezes bear are his. He treasures the river lapping at its pebbled edge, and the night wind roaring through the hilltop trees.

And in his thanksgiving he is humbly thankful that he can only wonder why some oak leaves do not fall; why the sumac changes color early; why the honeysuckle retains its vivid green all Winter; why some leaves are nutritious and others poisonous. He knows there are some things a man is not supposed to understand.

—The End

By Charles E. Travis, Jr.



QUIRREL hunting is enjoyed by many Pennsylvanians every fall and is a sport that can be indulged in by men whose age or health restricts them to not too strenuous exercise. Many other forms of upland hunting require extensive walking, but not squirrel hunting. It requires lots of looking and listening and little walking. If you are familiar with the section you are hunting, you no doubt have located the dens previous to the season and know just where the best spots are to sit and wait for the squirrels to make their appearance. This spotting of the dens and feeding patches cannot be emphasized too strongly. The fellow who goes charging through the woods making enough noise for a rhino not only spoils the hunting for himself but for any other hunter who may be in that vicinity. Lack of noise and fuss is the keynote to successful hunting of any kind.

I like to hunt squirrels with a .22 caliber rifle. While the most popular cartridge is the .22 long rifle, you may use many of the centerfire cartridges if you are one of those "gun cranks" who reload. My wife's favorite squirrel rifle is a .22 Hornet with a handload consisting of the 45 grain soft point bullet pushed by 3.5 grains of Unique which gives a muzzle velocity of 1480 feet per second and does a splendid job on a squirrel's head. Loads can oftentimes be worked up so one may use his deer rifle if he so desires. In this way he becomes more familiar with the feel and method of handling his big game weapon long before the real use for it comes around. Of course it must be clearly understood that I am speaking of greatly reduced loads in these rifles for squirrel shooting and not the standard deer load.

What ever rifle you select by all means equip it with a telescopic sight

to enjoy to the fullest the satisfaction that comes from knocking a squirrel from the top of a tall tree with a single bullet. The use of a telescope sight is a great aid in placing the bullet precisely where you wish it to go, and also is useful in locating your quarry, especially if the animals are much hunted and are difficult to approach to within sure hitting distance of iron sights. Often one may mistake a knot or a bump on a limb for a squirrel and let off a needless shot. While this usually does no real harm it broadcasts to all squirrels in the area that an intruder is abroad and this tends to keep them in their dens and makes your feelings less sanguine. This will not happen if you are using a scope as you can tell in an instant if the "bump" is game or not.

The many light repeating rifles available are excellent for this type of hunting, but many prefer a single shot. When one uses a single shot rifle for any appreciable length of time his actions are almost automatic and a single shot rifle can be loaded by one skilled in its use nearly as quickly as a repeating rifle. A sling is handy to carry the rifle to the shooting grounds and to the trained rifleman it is used for long shots from the sitting position. When you are taking advantage of a natural rest (tree trunk, fence rail, stump etc.) you must remember not to place the barrel of the rifle directly in contact with the object chosen for the rest because of the possibility of the shot being thrown out of the normal group.

A light barrel is more of an offender in this respect but the heavy or target barrels are not without guilt. Be sure to rest your hand between the object and your barrel or forearm, then you will be more certain of your bullet hitting the mark. You may have a preference as to the type of reticule you may wish to use in your scope, some leaning towards

the coarse single cross hair, some preferring the blunted picket post, and others, myself among them, preferring the dot reticule. This reticule has proven to be the best for my type of shooting which is mainly in the deep woods. The dot shows up clearly in light or shadow and against any type of background.

While hunting any species of game it is imperative that you do so with due regard to your safety and also to that of the other fellow. Never under any circumstances point your gun or rifle at anything that you do not intend to kill and be sure of your backstop at all times. I recall an incident that happened a year or so ago a few miles from my home. A young fellow was hunting squirrels before going to school one morning. He was in the woodland near his home and had spotted a squirrel. It was a little foggy and he was unable to see clearly for any distance. The squirrel was atop, a rail fence at the edge of the woods which bordered a cornfield. The boy shot, missed the squirrel and killed another hunter who was hunting pheasants in the cornfield. The small bullet entered the unfortunate chap's temple and death was instantaneous. So we always try to line the squirrel up with a big limb or against the tree trunk then there is no chance of the bullet doing any other damage.

There are various methods employed by successful hunters and the ones we like best for our type of country are about as follows. If two hunters are working together they should work a strip of woodland about fifty yards apart with one hunter slightly ahead of the other. First one and then the other fellow should pause and scan the tree limbs carefully as his companion keeps moving. You will be surprised how many squirrels this will turn up in sections that were thought to be shot out. The advantage of this method is that the squirrel thinks that only

one hunter is in the vicinity. As he hears the hunter approaching he quickly dodges to the other side of the tree and thinks himself safe from observation. What he really does is give the other hunter a chance for a perfect shot if he has wits about him and is attending to business.

When you are hunting in this manner you must keep your eyes peeled for the slightest thing out of place or the smallest movement which will betray the squirrel's presence. Don't expect to see the animal sitting in plain sight everytime like the cover picture on your favorite outdoor magazine. The thing to look for is an ear or the top part of the head sticking above a limb, or the tip of a tail hanging down from a limb as the owner lays flat on top and is completely out of sight. Then, by careful maneuvering, you can get yourself in position for an open shot.

My wife and I use this method whenever we hunt together and have employed it many times with success. There is a favorite spot of ours that contains about ten acres of timber down on the river's edge. This bit of woodland is long and narrow—a hundred yards at its widest point—yet we have taken a goodly bag of squirrels from here time and time again. We have come to regard it as our old standby as it seems to produce when other places fail. We usually start at one end and slowly walk through, stopping and listening every few feet. This kind of slow hunting is what really pays off as sometimes the squirrel is missed by both of us and gets jittery after a short wait and decides to make a break for it; then someone usually gets a shot. We try to give the other fellow every other shot to equal the amount of sport. After we have walked the full length of this section of timber we clean our squirrels if we have gotten any, then take a short rest and let things quiet down a bit in

the area we just covered. After a half hour's wait we retrace our steps and sometimes gather in a few more squirrels before reaching the other end. We never hunt this section more than two times in a season as we don't believe in hunting any spot too hard regardless of how much game it supports. This same bit of woodland may be the shooting ground of other hunters and if each shoots it too close there will not be enough breeders left to stock it for the next season. Incidentally, if you are in an area where the big timber that supplies the den trees has been cut down, you can give the squirrels a boost by supplying nest boxes for them. Nail kegs make good ones. Wire them up in a fair sized tree and the squirrels will do the rest. This method has been employed in several sections of the country by squirrel hunters of my acquaintance who report that the animals take to them very readily. Give this some serious thought if you are in a section where the squirrels are scarce.

If a squirrel dodges out of sight too soon to permit you to make a carefully aimed shot we resort to the following. The hunter who has seen the squirrel disappear softly calls or signals to his companion and he in turn slowly circles the tree. The other hunter meanwhile has taken up a stand alongside a tree being careful to rest his hand against the trunk to cushion the forearm or the barrel. He waits until the squirrel inches into sight. When enough of the body is exposed the shot is taken and usually the quarry ends up in the game pocket of the shooting jacket.

Another way to bring the hidden squirrel into sight is well known to the older hunters but may bear repeating here for the benefit of the younger shooters who may be reading this. When hunting alone, a favorite trick is to wait around quietly for ten minutes or so until the squirrel thinks you have departed,

then take a rock or a piece of tree limb and toss it to the ground on the squirrel's side of the tree. Usually bushytail will slip right around into plain sight thinking that you have walked around to the other side. This has worked for me many times, but not all the time, as some squirrels

have had this trick worked on them before.

In closing let me add that an ideal time to be hunting those silver shadows of the timber is on a sunny autumn afternoon, after a night of heavy rain. Good gunning!

. . . *The End*

### **Forest Ranger Displays Evidence of Deer Damage**

"As I write this I have on my desk three pine trees, brought in from a forest service plantation by Verland Ohlson, who is Foreman of a crew working on plantation release.

"Two of the trees are pitch pine, and the third is a Scotch pine. They were all planted eleven years ago, and yet I can hold the three of them between my thumb and forefinger.

"They are perfect little, flat topped pines in miniature like those potted Japanese conifers that, through skillful human manipulation, remain dwarf trees throughout their long domesticated life.

"The pines on my desk, though, which are just a foot high without their root systems, did not respond to the skillful hands of a Nipponese gardener, instead they owe their dwarf appearance to the feeding habits of an oversize deer herd.

"Apparently, just enough needles were permitted to remain on each tree, throughout its eleven-year life, to offset death. But, like continued malnutrition in humans, only a caricature of a tree survived in each case.

"At present, a nearly perfect balance appears to exist between the trees and the deer which derives some little nourishment from the pruning action they exert upon the tender growth. If the deer were a little more greedy, they would kill their means of sustenance. Had they been less greedy in the past the tender terminal tips of these trees would have made good height growth and normal trees well above the height of deer damage would have resulted.

"Evidently deer are highly selective feeders among planted conifers for close by are healthy red pine, planted at the same time as these dwarf pitch and Scotch pine, which are now fifteen feet high.

"The tenacious hold on life that these dwarf specimens demonstrate indicates that, given half a chance through a controlled deer herd and adequate fire protection, properly planted conifers will survive, and reclaim idle waste land on the Allegheny plateau. Some twelve thousand acres of successful plantations on the Allegheny National Forest have already demonstrated that.

"Unfortunately, however, some five thousand acres of unsuccessful plantations have failed largely because there were too many deer concentrated within the vicinity of these particular planting areas.

"An example of the hardiness and ability to grow well under unfavorable soil conditions, when deer do not over browse them, is the sample planting of red pine on strip mine backfill near Wetmore. When these were planted between the loose rocks and poor soil of the backfills their chances of survival were heavily discounted. Now, four years later survival is nearly one hundred per cent, and the trees are vigorous and shoulder high."

U. S. Forest Service.  
LARRY E. STOTZ,



# No Rack But—

Although some hunters still scoff at doe killing, most nimrods are well aware of the sporting and eating qualities of lady deer, realizing, of course, that sixty pounds of venison will give any family budget a much-needed lift.

In the following photo story George H. Gordon, staff photographer for the Pennsylvania Fish Commission, shows how a nice, fat doe is converted into steaks and roasts.

No rack? Well don't feel sorry for this deer hunter. He knows what savory morsels lurk beneath that handsome hide. Some teamwork with a couple of pocket-knives, —





A little bone work with a carpenter's saw and an ordinary hand axe, —

Some careful slicing with a long-bladed skinning knife—





Produces chops, steaks and roasts which, when packaged for human consumption, serve a better purpose than being a winter-kill.



# Deer Hunters —Attention!

**WHOM**—is this request directed toward? To all sportsmen who enjoy their deer hunting and wish to increase their enjoyment by doing something constructive.

**WHAT**—is this request? We are asking that you send us all the information possible on the deer that you kill, regardless of whether it is antlered or antlerless, fawn or adult. A standard form is provided for your convenience (see following page). If you want to include notes or comments on deer observations, hunting conditions, hunter activities, etc., we would be glad to receive them also.

**WHEN**—do we want this information? As soon after you kill your deer as possible. We prefer that you mail it directly to the Project Leader in order that its receipt can be speedily acknowledged and that you can be informed of its age. If for some reason you cannot do this, deliver it to your District Game Protector to be forwarded.

**WHERE**—do we want this information from? *All counties* where deer are killed. **WHERE** do you send it? Mail it to the Project Leader STANLEY E. FORBES, 229 MONTEREY AVENUE, RIDGEWAY, PENNSYLVANIA.

**WHY**—are we asking for your cooperation? It is impossible for the limited number of



research personnel to collect data covering the entire state during this short period. It is your sport. Do you want to improve it? We want to manage the deer herd to the best of our ability, but our ability is governed by the degree of your cooperation.

**HOW**—can you help best? Extract one-half of the lower jaw (include both front and rear teeth) from your deer, clean it as much as possible, air dry it for a day or two, wrap it securely (do not use wax paper), and mail it to the Project Leader. Include at least the basic information requested on the form. Pass the word around to your friends. Urge them to submit the information from their deer.

Your cooperation will help the Pennsylvania Game Commission provide better deer hunting for you.

DEER DATA SHEET

Killed: County \_\_\_\_\_ Date \_\_\_\_\_

Township \_\_\_\_\_

Sex: Male  No. of points: Right \_\_\_\_\_ Left \_\_\_\_\_

Diameter (1" above burr) \_\_\_\_\_ inches

Female  Pregnant: Yes \_\_\_\_\_ No \_\_\_\_\_

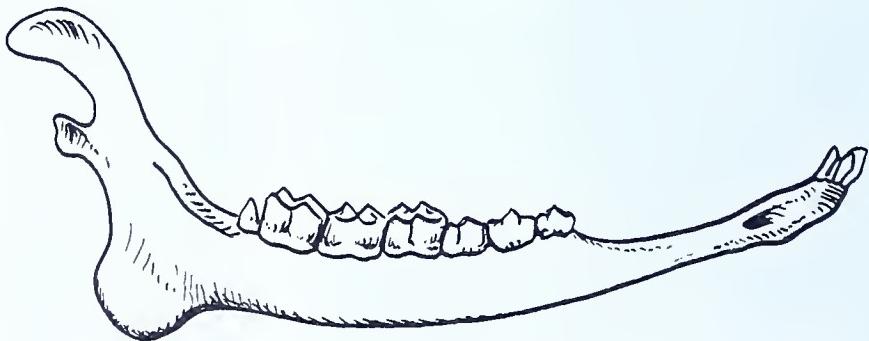
Lactating: Yes \_\_\_\_\_ No \_\_\_\_\_

Weight (actual weight preferred):

Hog-dressed, estimated \_\_\_\_\_ lbs.

Hog-dressed, actual \_\_\_\_\_ lbs.

Remarks: (shed antlers, deformities or disease, unusual condition, general remarks, etc.)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Fill out this form as completely and accurately as possible and forward with one side of the lower jaw of your deer to:

Stanley E. Forbes, 229 Monterey Avenue, Ridgway, Pennsylvania.



# *Outdoor Kids*

By Hal H. Harrison

"THE Old Master Painter from the faraway hills has been busy this week," Billy said to Jane as they walked through the woods that autumn Saturday morning.

The green forest was no longer green. It had changed to many shades of red, yellow and brown.

Who painted the leaves? Jack Frost?

No, Jack Frost does not paint the leaves although many children think he does. The answer is a simple problem in chemistry.

All summer the leaves contain a great deal of a green substance called chlorophyll (klo-rofill). As the tree works and grows, chlorophyll is needed in the food factory of every leaf.

In the fall, when the work of the tree is done for the year, no more chlorophyll is needed. As this green substance disappears from the leaves, other

chemicals that have been hidden there all the time start to show their colors. The most important of these chemicals are colored yellow, red and brown.

So it is chemistry that brings crimson to the red maple and the Virginia creeper; butter-yellow to the birches; quaking gold to a grove of aspens; dignified scarlet to the mighty oaks; deep red to the sassafras; and plum-purple to the ash.

Like so many great things that happen in Nature, autumn's beauty arrives silently and pretty much on schedule. It comes whether or not we have frost, but in the northern states, like Pennsylvania, frosts usually occur at about the same time each year. For that reason, so many people have come to believe that it is the frost that causes the leaves to change color.

Part of a tree's preparation for winter is the cutting off of sap from the leaves. The leaf stem then dries out and loosens. Finally the wind snaps the stem from the twig and autumn leaves come tumbling down.

This is just the tree's way of preparing for winter . . . the tree's insurance that it will live to bear fruit another year.

An old Indian legend tells us that the leaves change because the hunters in heaven have killed the Great Bear. The trees changed red when the bear's blood dripped on the forest. Fat from the cooking bear splattered out of the kettle and made other leaves yellow.

Of course, Billy and Jane know that the legend is just a story. But they also know that Jack Frost does not paint the leaves. Now you will know that too.

. . . THE END.



### THE BEAVER

Broadtail the Beaver is a builder of dams,  
His tail is a rudder, his front feet are hands.  
His hind feet are webbed and are used for swimming,  
His chisel-like teeth for cutting and trimming.  
He favors both aspen twigs and bark,  
And usually cuts them long after dark.

—Leo A. Luttringer, Jr.



### Tame Quail Raise Wild Young-uns

VENANGO CO.—In the spring of this year, ten pairs of quail from the Eastern Game Farm were released near my home in Venango County. These birds were very tame and paid very little attention until approached very closely by humans. Eventually they paired off, scattered over a five-acre area and proceeded to enliven the neighborhood with their cheery whistling. One neighborly little hen constructed her cleverly concealed nest in our yard a mere 10 feet from where I regularly park my car and proceeded to lay an average of an egg a day until she had twenty-two. The cock bird was never seen in the vicinity of the nest from the time it was discovered, but the hen was very devoted and courageous in defense of her nest.

She hatched twenty-one chicks and spirited them away promptly. The remaining egg had been damaged and when opened it contained a fully developed chick which was dead. Significantly, this tame hen had done a very skillful job of concealing and educating her offspring. She and her brood have only been seen on three occasions and then so briefly that it was impossible to count the chicks. However, there were quite a few of them still going strong at three weeks old. Student Officer William E. Lee, Ross Leffler School of Conservation.

### Snake Picks Off Ailing Squirrel

CARBON CO.—In July while hunting crows in Carbon County I came upon a black snake with a gray squirrel it had almost completely swallowed. After killing the snake I removed the squirrel and found it was very thin. The squirrel must

have been diseased and not starved, for there was plenty of food in the area. Student Officer Arland P. Reed, Ross Leffler School of Conservation.

### Poor Bruin

TROUTVILLE, Clearfield Co.—During the past month two service corps men, Joseph Swartzlander and Clyde Gonterio, were going to work on State Game Lands No. 93 when they observed a fair sized bear traveling along ahead of them. As they approached the bear they saw that he was carrying some object in his mouth. At that time the bear decided to shift into high gear, still retaining the object which turned out to be a paper shopping bag which some person had filled with sweet corn cobs and deposited along the highway. Poor bruin took a beating in that deal, as the bottom dropped out of the shopping bag. He lost all of his corn cobs but still retained the bag. District Game Protector Claude B. Kelsey, Troutville.





### Little Troubles Outweigh Big Ones

MILFORD, Pike Co.—Raccoons and skunks have been causing numerous complaints relative to damage in sweet corn. In fact, in my district, damage by these animals has outweighed deer damage complaints by eighty per cent. District Game Protector John H. Lohmann, Milford.

### Where Are They In December?

MONTROSE, Susquehanna Co.—On Saturday, August 23, while driving towards Susquehanna on the south side of the river, I spotted eight deer feeding in a field across the river. Upon checking them with the glasses I found that five of them were very large antlered bucks. District Game Protector James W. Clouser, Montrose.

### A Woman's Touch

HONESDALE, Wayne Co.—This year Annabelle Eskra came through with another very good record with pheasant chicks raised under the day-old chick program. Mrs. Eskra received 450 day-old chicks. We caught the birds for release on Wednesday, August 27, 1952. She had 435 birds, all in good condition. This is a record of 99.77 per cent which is very good. Her record last year was better than 96 per cent. I think that Mrs. Eskra, as well as other farmers

who are raising these birds for release, deserves a big hand from the sportsmen of Pennsylvania. District Game Protector Robert H. Myers, Honesdale.

### Smorgasbord For Bears

MILESBURG, Centre Co.—A three-legged mother bear and her cub have been providing entertainment as well as causing considerable damage in Spring Township, Centre County.

Her latest menus have consisted of ham, apples, corn, and fresh turkey. A 10 lb. ham was fished from a camper's spring and a 3 lb. bag of apples was taken from the camp porch on August 12 in broad daylight. A couple nights later she visited a farmer's corn field. According to the farmer she was very nice about her meal, only knocking down what corn she could eat.

On the following Sunday, three young men reported to me that they had seen a bear and cub eating young turkeys that the mother had killed. As these young men drove along the dirt road in the vicinity of the ham-stealing episode, they saw turkeys jumping and flopping around. They then saw the old three-legged bear killing young polts, three or four in their estimate, eating some herself and dividing up with Junior. District Game Protector Charles M. Laird, Milesburg.

### Loaded Guns and Gasoline Don't Mix, Either

GELATT, Susquehanna Co.—Regardless of how one looks at it, no good comes of carrying a loaded gun in a vehicle upon a public highway as is proven by the following incident. While on general patrol shortly after woodchuck season opened, this officer saw a farmer on a tractor circling through a newly cut hay field. The farmer cradled a rifle in his arms. Apparently seeing no chucks, the farmer drove the tractor, which had a

buck rake attached, back onto the highway. Without stopping he attempted to unload his rifle, with the result that while thus engrossed the tractor ran off the road. Before it could be brought under control again it crashed into a stone wall and broke a tooth from the buck rake. Automobiles or tractors, a loaded gun spells trouble for someone. District Game Protector Donald G. Day, Gelatt.

#### Sportsmen Pay for Vandal's "Fun"

MERCER, Mercer Co.—In my district last fall a registered cow was shot in mistake for a deer on the first day of the buck season.

Now woodchuck season is here and on July 20 a Mr. Richardson had one of his prize cows shot and killed by a high-powered .22 rifle. I am wondering whether or not this vandalistic shooter took this cow for a woodchuck. The outcome for this fall will be—more posted land. District Game Protector Arthur T. Biondi, Mercer.

#### Mouse Pulls a David and Goliath

HORSHAM, Montgomery Co.—In August, a counselor at the Boy Scout Camp at Treasure Island related an unusual happening to me. The scouts had captured a fair sized

rattle snake and had it in their exhibit at the camp. One day they put a live mouse in the cage as food for the snake. The mouse however, turned the tables when it took a bite of the snake several inches from the tail. Several days later the snake was dead, an infection had developed in the wound which proved fatal. District Game Protector Donald L. Croft, Horsham.

#### Near-Perfect Record for Chick Raising

WEATHERLY, Carbon Co.—Here is a mark for organizations to shoot at that are raising day-old pheasant chicks. The Bowmanstown Rod and Gun Club erected a holding pen this spring and had received 200 day-old pheasant chicks from the Eastern Game Farm on June 10, 1952. At the present time the birds are eleven weeks old and one bird has been lost when it broke its neck by flying against the holding pen. This is a remarkable record, especially for a new cooperator in the Commission's day-old chick program. District Game Protector Glenn A. Kitchen, Weatherly.

#### All Out Aid for Mamma

FRANKLIN, Venango Co.—On checking his fox traps a local trapper recently saw what looked to be two raccoons in one trap. As he moved closer he saw that there were three there. He had caught a large female by the front foot. Beside her, but not in the trap, was a young raccoon and the third one was a large male raccoon. This male appeared to be biting the trap and trying to release the female. As the trapper approached the trap the male walked slowly away but only went a few feet. The trapper then released the female unhurt and all three raccoons then ambled off into the woods to continue their family life in some quieter place. District Game Protector Clyde W. Decker, Franklin.





PHC Photo

"The doe hunters were just about the same bunch that go every year for a buck."

By Jim Kjelgaard\*

I'M probably one of the twenty-seven people in the state who agrees that the Pennsylvania Game Commission was entirely correct in declaring an open season on antlerless deer. Not that such concurrence with their policies will cause the members of the commission any special elation,

but it should be a great comfort to them to find out that at least one Pennsylvania hunter doesn't consider them as devils in the guise of human beings.

A lot of publicity descended on the Game Commission due to the fact that they did open the season on does, and not much of it was favorable publicity. Similarly, the sportsmen of the state, and sportsmen is the proper word, came in for their share of heckling.

\* (Editor's note: This article originally appeared in the March 1939 issue of Fur-Fish-Game Magazine. It is felt that Mr. Kjelgaard's common-sense approach to the perplexing deer problem is the perfect answer to critics of the "doe season".)

"Massacre of deer in Pennsylvania," ran the screaming headlines in one paper. "Pennsylvania hills red with blood of slaughtered does," another proclaimed. Even those few editors who agreed that there were too many deer, and that they should be cleaned out, did not elevate the hunters who took them to the dignity of being called hunters. They were "meat hunters." I personally think, nobody has to agree with this but I still think, that seventy-five per cent of those who denounced the doe season banked their arguments on maudlin sentiment and nothing else. They just didn't know what they were talking about. I demand no exclusive privileges in considering them cockeyed. They are entirely at liberty to consider me the same way if they think best. Deer have two values, a practical and an esthetic one. Their esthetic value springs entirely from the fact that they are nice to look at. Their practical value, and this by far outweighs the other, is that they are even nicer to hunt. Countless thousands of men and women plan their vacations every year so they can go deer hunting.

Every year the hunters in Pennsylvania kill from twenty to twenty-five thousand bucks. Obviously that's a lot of bucks. When the total buck kill of seven or eight years is added up, it's even more bucks. The result is a disbalance between the sexes, with twenty does for every buck.

A fair percentage of the does go barren, and there is no cogent argument against this. It's all right, if there's too many deer what if every doe doesn't produce a fawn every year? The answer is, that if bucks continue to be killed, there are fewer bucks and thus the fawn yield continues to decrease. As soon as a buck fawn grows two or more points to one antler, he may legally be shot. The does, being protected, may grow up and be something nice to look at.

They multiply to an unbelievable

extent in a state like Pennsylvania that's supposed to be largely industrial. In the mountain regions one of the favorite spring and autumn pastimes is "jacklighting." Not with a gun. Anyone found with a gun in his possession and a spotlight focused on a deer, is liable to a very heavy fine. That is as it should be, but it's perfectly permissible to venture forth in a car with a spotlight if you don't carry a gun. It's a lot of fun too, and anyone who has ever tried it will bear me out that it's not unusual to count anywhere from one to three hundred deer in a comparatively short space of time, and you don't have to leave the highways to do it.

Pennsylvania may be justly proud of having such a deer herd, and the sportsmen of Pennsylvania should be proud of a Game Commission with sense and courage enough to employ common sense in the administration of that herd. In summer, when there's plenty of grass and shrubs for them to eat, the herd gets along in great shape. In winter it's a different story.

Last winter was a comparatively mild one. There was little snow, and no excessive cold. Yet a forest ranger, whose name will be furnished on request, told me that he found eleven dead deer in a two mile walk. They starved to death. I accompanied the ranger on a trip through some of Pennsylvania's best deer range early last spring. We found six more winter killed deer, and saw at least ten that could not run more than a few hundred feet. They just had not been able to get enough food. Of fifty deer that we were close to, few if any were in good condition. I wonder if any of those who gnashed their teeth so fiercely at the open doe season ever saw the pathetic heap of skin and bones that a starved deer is? Or if those who howled so fervidly about wounded deer going into the brush to die ever happened on a live deer that, because it could not find enough to eat, lay down until it could do

no more than raise its head as men approved.

This brings us again to the fawn question. A doe that comes through the winter thin and half starved, is not going to bear a strong and healthy fawn. If it lives at all, the fawn is very apt to be undersized and scrawny. When, in its turn, this deer bears a fawn, it is more likely to be small than large. There was no weight limit on antlerless deer that could be killed during the past season. Some of the boys brought in deer weighing considerably less than fifty pounds.

One game warden, whom I have every reason to think knows what he is talking about, told me that many of these alleged young deer were really adults that had attained their full growth and never would get any bigger. Another said that small deer were the kind to shoot. When the browsing became scant in winter, and the bottom shoots of the trees were eaten, the small deer could not reach higher and were the first to die.

That the hunters who fared forth into Penn's woods to bag a doe were an army of meat and pot hunters, I hotly deny and resent. They were just about the same bunch who go every year to get themselves a buck—and most of them were very good sportsmen. Some of the old hands, who didn't especially want to kill a doe, stayed home. Many of them hunted. There were a lot of greenhorns in the woods, of course. Plenty of them got their first deer, and they seemed to be just as proud of it, and get just as much kick out of it, as though it had been a twenty point elk.

Admittedly there were a lot of poachers and game hogs loose in the woods. Some of them killed more than one deer, some probably killed as many as a dozen. I hope they get caught. But, like the poor, poachers and game hogs we always have with us. It's ridiculous to suppose that

there was some sinister influence underlying the open doe season that produced any more of these unsavory birds than there usually are.

The very amount of the game bagged, I don't know the exact figures but the last authentic figure I heard was more than ninety-four thousand deer, proves that the Game Commission was justified in declaring the open season on does. The season was open only a week. The very fact that there were that many deer killed in a week is in itself proof that there were too many deer in the woods.

I was in the woods during deer season, and there wasn't anybody particularly prominent who was tearing up and down the hills with a rifle in his hand and slaughter in his eye. Ninety-nine and nine-tenths per cent of the hunters were good guys, the kind you and I like to know. They had their camps, along with everything that goes with a deer camp, and they left their guns there as soon as they had bagged their doe.

They killed plenty of deer, maybe forty per cent of the total kill, from their cars—or rather from the road beside their cars. If they were driving along, and happened to see a doe they wanted, they stopped their cars and got out and shot it. I would do the same thing, so would you and the most pious hunter who ever toted a gun. But this doesn't prove them meat hunters. There is no fine distinction between shooting a deer from a highway and walking ten miles back into the woods to shoot one.

There was considerable clamor about the good old days, etc., and the style of hunting that prevailed then. That's sheer applesauce. Any return to the "good old days" and there wouldn't be a thousand deer where there's a hundred thousand now. Leafing back the pages to the good old days you discover that it was per-

(Continued on Page 35)

# Bucks County

*Twenty-seventh in a Series*

*Note: If desired, this center sheet can be removed without damaging the magazine, by loosening the two center staples.*

## Land Area

Bucks County contains 400,000 acres of which 73,812 are forested. Of the remaining 326,188 non-forest acres approximately 182,341 are under cultivation, with 188,658 susceptible of cultivation. State Game Lands total 3703.7 acres.

## Topography

Rolling country in the northern half; flat in the southeastern portion. Bounded on the east and south by the Delaware River and irrigated by numerous small streams.

## Transportation

Principle transportation includes the Pennsylvania and Reading Railroads, the Lincoln Highway (U.S. 30), and the Lackawanna Trail (U.S. 611). Other important routes also traverse the county which has a total of 774 miles of improved State Highways.

## District Game Protectors

Edwin W. Flexer, 232, East Broad Street, Quakertown, has jurisdiction over Dunham, Bridgeton, Springfield, Mockamixon, Tinicum, Milford, Richland, Haycock, West Rockhill, East Rockhill, Bedminster and Hilltown townships.

Earl S. Carpenter, 84 Shewell Avenue, Doylestown, has jurisdiction over Plumstead, Soleburg, New Britain, Buckingham, Upper Makefield, Lower Makefield, Harrington, War-

wick, Wrightstown, Newtown, Warminster, Upper Southampton, Lower Southampton, Middletown, Falls, Bristol and Bensalem townships.

## Fish Warden

Harry Z. Cole, 1426 Astor Street, Norristown, is the chief law enforcement officer for the Fish Commission in Bucks and Montgomery counties.

## District Forester

The District Forester for the area in which Bucks County is a part is Mr. Wilford P. Moll, 1938 West Main Street, Norristown.

## Agriculture

Commercial vegetables for canning and marketing, poultry and eggs, corn, hay, grains, swine, livestock and dairying are the principle agricultural benefits.

## Industry

Boat building has been an important industry since shipyards were first established at Bristol in 1785. Other products include sand, gravel, black granite, textiles, metal products, chemicals and scientific instruments.

## Historic

William Penn himself issued the writ for the first provincial election on February 20, 1683, which chose members of the Provincial Council and the General Assembly. Until 1705 the seat of the government was in Falls township, but later Bristol was designated county seat by the Assembly and a court house was erected there which was used until 1726, when the courts were removed to Newtown. There they remained until 1810 when Doylestown was made the county town, a third court

A diagram of a right-angled triangle. The horizontal side at the bottom is labeled "base". The vertical side on the left is labeled "height".

KEY . . .



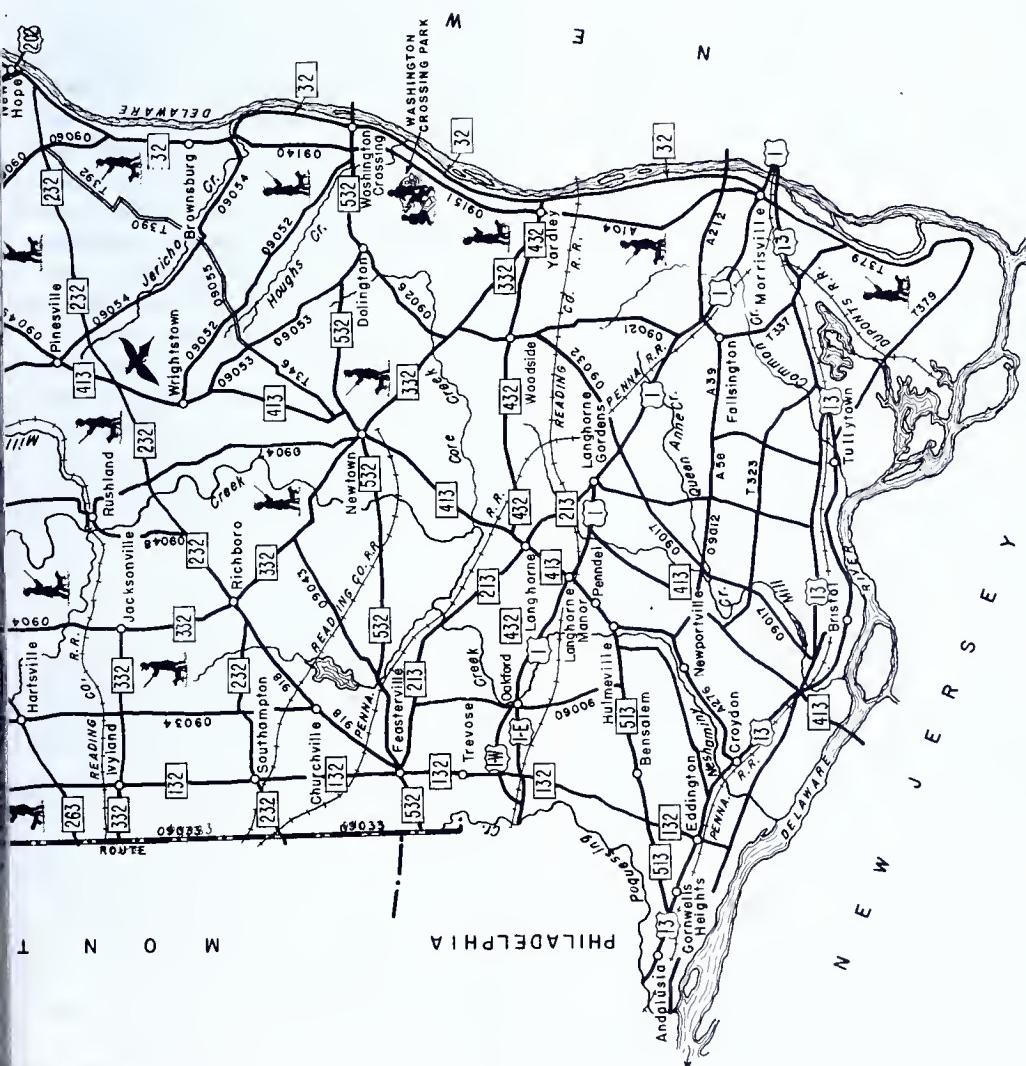
5



PENNSYLVANIA  
GAME COMMISSION  
**BUCKS**  
**COUNTY**  
PENNSYLVANIA

Scale in miles

AM-1952



house built. Doylestown got its name from William Doyle who owned for many years an old colonial inn at that place.

Bucks county has played an important part in the growth of the State and the Nation. It helped supply Forbes' army with wagons and it was from the Bucks County side of the Delaware that General George Washington led his Continentals in the famed Christmas night attack upon the British at Trenton in 1776. It was from Newtown that Washington sent his report of the victory to Congress.

Washington's Crossing Park is now one of the great liberty shrines of the county. Bucks was also the scene of Revolutionary campaigns in 1777, and the county is dotted with sites of Revolutionary encampments and maneuvers. General Daniel Morgan and General Andrew Pickens were both born in the county. General Jacob Brown, commander of the Northern forces of the United States in the War of 1812 was a native descended from its earliest settlers. General Henry Delp Styer, native of Sellersville, served with distinction in the Spanish-American War, in the Philippines, and as a Brigadier General in World War I.

Bucks County has produced many other notables. Sebulon Pike, explorer of the Great West, spent his boyhood in the county. Samuel D. Ingham was a member of Andrew Jackson's cabinet as Secretary of the Treasury for a time. John Fitch first ran a boat with steam power in Bucks County on a pond below Davisville in 1785 and later on the Delaware. The first canal was begun in the county in 1827 and connected Bristol with Easton by 1932.

#### Recreation—Hunting

Small game, especially rabbits, squirrels and ringnecks, provide most of the upland game hunting but raccoons and woodchucks also occur.

Some deer are found in the wooded sections—in fact over sixty were killed in one season. There are four State Game Land areas in the county on most of which public shooting is permitted. Two are near Perkasie and Sellersville; one is west of Route 611 in the section of Ottsville—Ferndale; and one is east of Route 611 above Ferndale.

#### Recreation—Fishing

Many creeks drain and irrigate Bucks County including the famous Perkiomen. Others include Crooks Creek (brook and rainbow trout) Springtown, Route 412, 8 miles; Ingram Creek (brook trout) New Hope, Route 202, 2 miles; Mill Creek (brook and rainbow trout) Doylestown, Route 611, 6 miles; Bristol Pond (black bass) Bristol, Route 13, 55 acres; Lehigh Coal and Navigation Company Canal (black bass) Bristol 13, 23 miles; Neshaminy Creek (black bass) Chalfont, Route 202, 32 miles; Little Neshaminy Creek (black bass) Neshaminy, Route 611, 5 miles; Northeast Branch Perkiomen Creek (black bass) Sellersville, Route 309, 8 miles; East Swamp Creek (black bass) Quakertown, Route 309, 5 miles; Tohickon Creek (black bass) Quakertown, Route 309, 21 miles; Warren Lake (black bass) Revere, Route 611, 40 acres.

#### Recreation Areas

Other forms of recreation can be enjoyed in the southeastern part of the county especially a trip to the Bowman's Hill Wildflower Preserve. Then there is Washington Crossing Park which marks the place where Washington's Army crossed the Delaware River on Christmas night, 1776, before the historic battle of Trenton, and Roosevelt State Park which includes 40 miles of the old Delaware Canal between Raubsville Lock and Yardley.

. . . *The End.*

(Continued from Page 30)

factly all right to set a hound on a deer's trail, and to kill it after the hound had run it to earth for you. It was legal to jacklight, to kill as many as you could possibly shoot, and otherwise to act just about as you saw fit.

One hunter who has left a record of the good old days and the type of hunting favored then has left a record that he killed twenty-two deer, but he could not use all the venison, so he took only the haunches. Sign for the good old days if you want to. I'll take the present, doe season and all.

As far as the extermination of deer in Pennsylvania is concerned that's more hooey. I killed a doe on the opening day of the season, and minus a rifle set out on the last day to see how the boys were doing. The trip I took involved a twenty mile ride during the course of which we saw fifty-one deer, and a nine mile walk, where we saw twenty more deer. That was on the last day of the season, not the first.

Aside from this, I took it upon myself to interview some of the boys who make their living in the woods, and may justly be said to know what it is all about. They aren't armchair hunters, but men who are acquainted with game, and encounter it every day in their lives. It was also my good fortune to get the opinion of one official of a first-rate rod and gun club. All names will be furnished if wanted.

The woodsmen and farmers interviewed all had substantially the same views. Their opinions can be summed up in that of the first man I saw. He is a small farmer who traps in the winter.

"There were too many deer. It was time for an open doe season. But gosh, the hunters hardly got into the back country. There's only a few tracks in the country lying more than half a mile from the road. Deer there

### STOLEN GUN

Edward P. Dufton, Dufton Hardware Store, Clearfield, reports the theft of a new Marlin lever action rifle, model 336, serial number 58049, from his store. Information leading to the recovery of this gun would be greatly appreciated by the owner.

are thick as ever. Something should be done about them."

And the officer of the club: "We needed an open doe season. Let those who don't want it in their counties get together and close the season there. It did our county good, and I hope they'll open doe season here again next year."

All of which sums up to the fact that we've got a swell Game Commission, and one that knows what it's about!

. . . . The End

In order to make a tablespoonful of honey, a bee must visit about 2,000 flowers.

\* \* \*

The Hummingbird occurs only in North and South America. There are over 500 species in South America, but only one, the Ruby-throat, is found in North America east of the Mississippi.

\* \* \*

More menhaden are caught in the United States each year than any other fish. They are used as food, fertilizer, and a source of oil used in making leather, steel plate and linoleum.

\* \* \*

Korean hunting licenses, peace time, that is, carry the following: "Hunting in public streets, shrines and temples is not permitted. Firing at buildings, people, cattle and street cars is not permitted."

# *Christmas Gift Suggestions for the Sportsman's Bookshelf*

## FUN WITH TROUT

By Fred Everett

287 pages. Profusely illustrated 4 full-color plates and hundreds of black and white illustrations. Published by the Stackpole Company, Harrisburg, Pa. Price \$7.50.

This beautiful book is really three books in one. Its first part includes information on all phases of trout fishing, from tackle, through fishing techniques to playing and landing the fish. The second deals with the natural history of trout, and the third with the perpetuation of the sport of trout fishing. Besides being a splendidly written volume the illustrative material is of the highest quality. Really a deluxe addition to the bookshelf.

## A CUP OF SKY

By Donald Culross Peattie

242 pages. Numerous black and white drawings. Published by Houghton Mifflin Company, Boston, Mass. Price \$2.50.

For those who love the beautiful and curious things of nature—the wind and the weather, the moon and stars, fire and water, this book will unfold many mysteries. Fireflies, bats, ferns, spider, silk, honey and many other thought-provoking subjects are delightfully covered.

## GUNNERMAN

By Horatio Bigelow

246 pages. Illustrated with appropriate photographs. Published by the Derrydale Press, New York. Price \$7.50.

Good reading for the man who loves the pleasure filled memories of days afield. Talkin' Turkey, Hits and Misses, and Jes' Birds are a few of the tantalizing chapters that will whet your appetite. A fireside book that will never grow old.

## EAGLE MAN

By Myrtle Jeanne Broley

210 pages. Profusely illustrated with a collection of remarkable photos by Charles L. Broley. Published by Pellegrine and Cudahy, New York. Price \$3.50.

This is the thrilling story of a man, Charles Broley, who has spent much of his

## BOOK NOTES



lifetime studying and photographing eagles. Having seen color motion pictures taken on some of Mr. Broley's expeditions, we are convinced that the reader will derive from this delightful and highly educational book the same thrills we experienced in seeing the action it portrays.

## CALLING ALL GAME

By Bert Popowski

306 pages. Many humorous pen and ink drawings. Published by The Stackpole Company, Harrisburg. Price \$4.00.

This is a book on know-how by an author who's had plenty of experience. When you get into chapters like—Bob White Whistles, Calling All Puddlers, Squirrel Strategy, Decoying the Divers, Prescription for Bucks, Glassing your Game, Thanksgiving Birds, and numerous others you'll never hear your wife calling you.

## CALLING ALL VARMINTS

By Bert Popowski

308 pages. Numerous black and white illustrations. Published by The Stackpole Company, Harrisburg. Price \$4.00.

This book is the companion piece to Calling All Game, and gives many an ardent hunter who limits his activity to the open game season something to think about and consider seriously. There is great sport to be had with unprotected birds and animals, and the hunting of them can take place any time almost anywhere. Furthermore, as a conservation measure, any of these varmints should be controlled. The hunter is not restricted by short seasons and closed seasons; he can take his rifle or gun into the fields or woods at his convenience, and compete with just as keen and clever an adversary as the game he loves to stalk. This book shows the way to greater pleasure in the field and woods.

## SPORTSMAN'S COUNTRY

By Donald Culross Peattie

180 pages. Numerous black and white illustrations by Henry B. Krane. Published by Houghton Mifflin Company, Boston, Mass. Price \$3.00.

This book is a natural for the fellow who wants to learn more about the environments,

foods and habits of his favorite game or fish. You won't want to lay it down until you are finished and when you are finished you will have learned a great deal in a simple, pleasant way.

### BLACK BASS

By John Alden Knight

*200 pages. Illustrated with numerous photographs and an adequate number of drawings and diagrams. Published by G. P. Putnam's Sons, New York. Price \$4.00.*

This well written work contains everything the bass fisherman should know and provides him the means to gain greater enjoyment and productivity from his sport. Both the largemouth and smallmouth species are treated with equal authority and much of the book is devoted to the various methods of catching these fish. You can't go wrong.

### NORTHERN FISHES

By Samuel Eddy and Thaddeus Surber

*276 pages. Eighty-four species illustrated in black and white, nine in full color. Published by The University of Minnesota Press, Minneapolis. Price \$4.00.*

Here is one for every angler's bookshelf. It is a real authoritative study of more than 150-fresh-water fishes containing 93 illustrations, nine in full color. The "hows" of catching fish are entertainingly revealed, and there is an excellent background of information on the habitats of the game species. Why not wet a line?

### A GUIDE TO BIRD FINDING

By Olin Sewall Pettingill, Jr.

*659 pages. Numerous excellent black and white pen drawings by George Miksch Sutton. Published by Oxford University Press, New York. Price \$5.00.*

Here is a book that will tell you what birds are to be found at what times and in what places. The ornithology of 26 eastern states is covered with detailed information on species, important concentrations, breeding colonies, wintering aggregations, habitats, etc. For the bird lover who travels this book is like a guide to the best eating places.

### BEGINNERS GUIDE TO ATTRACTING BIRDS

By Leon A. Hausman

*127 pages. Twenty-seven pages of black and white illustrations, Published by G. P. Putnam's Sons, New York. Price \$2.00.*

This text shows how to build feeding stations, bird houses, seed trays and other

bird attracting devices. It tells about the kinds of food to provide in all seasons and what kind of bushes and trees to plant to attract them to garden or yard. This is a practical book that every bird lover should possess.

### THE SANDHILL CRANES

By Lawrence H. Walkinshaw

*202 pages. Full color photo frontispiece and excellent black and white photographs of the subject. Published by Cranbrook Institute of Science, Bloomfield Hills, Michigan. Price unknown.*

A documentary account of the life history of this colorful bird, which is truly one of the most interesting creatures of our continent. The bird lover will enjoy the description of the bird's dance. This demonstration is a fascinating thing to observe because it is fraught with stiff-legged jumps and courtly bows. Feeding habits, nesting, etc., also are intelligently discussed.

### BIG GAME RIFLE

By Dr. Henry M. Stebbins

*237 pages. With photos of practically all of our high-powered rifles and cartridges. Published by the Sportsmen's Press, Washington 6, D. C. Price \$5.00.*

Here in compact and entertaining form is a book chock full of information that will help you select and use both new and old rifles. It is the story of the American big game rifle from 1873 to 1952 told from the practical viewpoint. Businesslike though the treatment is, a breath of the outdoors blows through the book, challenging the reader to get out under the sky come huntin' season.

### ALASKAN ADVENTURE

By Jay P. Williams

*300 pages. Many and varied photographs of Alaskan wildlife and scenery. Published by The Stackpole Company, Harrisburg. Price \$4.50.*

We've read a good many stories of the north country but here's one that ranks among the best. It is a tale of wild, unspoiled Alaska, of primitive man fighting for survival, of great bears, of life struggles on swift rivers and high mountains, of wolves that dogged man's trails, of hunger and cold. There are the brighter aspects too, all penned by an author as he went and lived and saw. Need we say more?



# SLANTS and ANGLES



Dear Sir:

I have just finished reading the PENNSYLVANIA GAME News and want to thank you for such a wonderful publication. I class it among the best.

I am a barber in my unit and I make sure that GAME News is on the shelf as soon as I receive it. Readers from famous game sections of the U. S. agree that it is the best and often stop by the shop to see if I got a later edition.

I have seen some of the greatest big game country that there is in this territory and I now realize what a tremendous job the Pennsylvania Game Commission is undertaking and doing and I hope to take a bigger part in it soon.

A Pennsylvania Sportsman,  
Fort Richardson, Alaska

Dear Mr. Frye:

Today I purchased my 1952-53 hunting license preparatory to a hunt for woodchucks in northwestern Pennsylvania on Labor Day. In looking over the seasons etc. I noticed that the woodchuck is listed as being protected in October only. I noticed this also in the August issue of the PENNSYLVANIA GAME News but didn't think too much of it at the time. I hope I am correct in thinking that this protection during October only means only for 1952 and not that you have lifted the protection from this splendid animal for all of next year, except October.

I am an enthusiastic woodchuck hunter and have been for the past twenty-six years and have close to two thousand dollars invested in my chuck rifles, loading and bullet making tools, scopes, binoculars etc. I

have preached for years not to kill chucks during the months of April and May long before you folks put the much needed protection on the chuck and had a lot of fellows here in Pennsylvania and also in New York State doing the same. It is far from being a sportsman for a fellow to shoot a pregnant sow or one that has suckling young in the den. As these young, as you well know, are left to starve which is a slow and painful death. I usually kill around 200 chucks here in Pennsylvania and three times that number in New York per season, but I draw a very sharp line in killing any before June 1st anywhere.

If you think that the chucks are getting too thick why don't you remove the daily limit which in some sections can be obtained in a matter of minutes at times. I have been to places where twenty chucks would be in sight at one time and in New York state forty chucks shot from late afternoon until evening would be common if you get on the right farms. Now don't misunderstand me Mr. Frye, I don't want the daily limit raised unless you have taken the protection off the chuck but to permit the shooting of these splendid animals during April and May is downright ROTTEN. The pressure on them from the host of additional hunters is bad enough without doing a thing like this. Of course I or any of my friends will NOT shoot chucks during this early season even if it is permitted and will do everything in our power to keep hunters who don't know any better from doing so also.

Sincerely,  
Charles E. Travis, Jr.  
West Chester, Pa.

Dear Sirs:

I would like to say this about hunting on the other fellow's property.

I have made it a rule to see the farmer before hunting season and getting his permission and most of them tell me, "Sure, haul your car in the lane and help yourself."

. . . One thing sure, you need the farmer more than he needs you. Let's be friends with him and if you get an extra rabbit or ringneck rooster give him one. He likes them just as much as you do.

It's a good idea to go out and see our farmer friends before the season. I know you will have a nice visit with him and if he is not busy ask him to go along when you go out to hunt.

S. B. Frederick  
Dayton, Pa.

Editor:

We live in the wooded ridge between the Susquehanna River to the North and the Clearfield Creek to the south, a vast area of timber and brush on either side of our farm. Since 1888 we have kept some truck garden and 35 acres of apple orchard. These trees are now old, high and difficult to maintain. So the fruit not being marketable is left for wildlife—squirrels, grouse, turkeys, bears—yes, all of these are now silent partners. The deer and bears come to the feast mostly by night in consider-

able numbers, I believe as far as three miles.

From November 'til April when deep snows or crust do not occur they are pawing and rooting the apples out and they seem to be little spoiled.

Now, my idea is to advance the proposition of planting apple trees for them on open spots, the margin of the mountains and abandoned fields. They should be propagated by root graft, closely planted in nursery rows to induce tall trees to be out of reach of the browsing deer. Or you may be able to get tall trees from nurseries at a low figure. Apple seed could be planted on the wild lands but would have to be protected for a time.

As to variety for game food, the York Imperial is stout wood and stands up well and is a regular bearer. Ben Davis fruits well, but is not so long lived. Tollman's Winter Sweet would be a good one. An apple project like this would not be very expensive and since nuts are scarce would be a winter support for game.

My failure to see well can hardly be my age, since I am only in the first year of my tenth decade. Tried to get my first deer in the winter of 1875—I believe about the only one there was then. Failed as so many others do, left my "stand" or "watch" a minute too soon.

D. H. Watts  
Kerrmoor, Pa.

#### 1932 BAND FOUND ON PINTAIL

A duck banded 20 years ago was shot by a California hunter during last year's late hunting season and proved to be the oldest leg band return on State records.

"It tasted good, too," reports surprised hunter James P. Gormley of (61 Cunningham Street,) Vallejo, "at least none of my dinner guests put up a squawk the night we ate it."

The female pintail was given a metal leg band by the U. S. Fish and Wildlife Service at Ellinwood, Kansas, on March 1, 1932. Gormley bagged it near Sacramento on December 15, last year.

Appropriately, Hunter Gormley was using an old gun, too. It was a 1912 model Remington inherited from his father.



# CONSERVATION NEWS

## **Joseph H. Barkley New Head Of PFSC**

Joseph H. Barkley of Punxsutawney was elevated to the office of president in the Pennsylvania Federation of Sportsmen's Clubs during the annual convention, following the resignation of S. Dale Furst of Williamsport. Other members of the official family elected included: Raymond H. Armstrong, Guys Mills, 1st vice president; Steve Emanuel, River Rd., Wilkes-Barre, 2nd vice president; Charles H. Nehf, Allentown, secretary; and Glenn C. Dodds, R. F. D., Smiths Ferry, treasurer.

Merrill C. Merritts of R. F. D., Petersburg, was also re-elected as delegate from the PFSC to the National Wildlife Federation. Alternate, also re-elected, fell to the lot of Charlie W. Stoddart Jr., State College.

### **Camp Attended by 159 Boys**

"This has been a banner year for the Junior Conservation Camp. A total of 155 Pennsylvania boys attended the camp during the eight-weeks period. They represented sixty-one out of sixty-four organized counties in the Federation and sixty-one out of sixty-seven counties in Pennsylvania. The quota for the camp was set at 149 boys, and including the four boys from Delaware, we had a total of 159. Three organized counties did not send boys to the camp; they were Crawford in the Northwest Division, and Snyder and Montour in the Central Division. Adams, Pike, and Mifflin are unorganized counties.

"Attached to this report is a financial report of the camp. This is the first year that we have shown a sub-

stantial profit in the operation of the camp. The money will be retained in the bank as a "kitty" for next year's operation.

"The following program, which reflects one or two changes from the previous years' programs was carried out during the summer of 1952: Report; Survival, (Bureau of Parks); Survival, (Sanitary Water Board); Forests and Waters; Forests and Waters,  $\frac{1}{2}$  day; Practical First Aid and Water Safety,  $\frac{1}{2}$  day; Forestry; U. S. Soil; Chapel Service; Archery; Wildlife Research; Fish Commission; Game Commission; Game Commission  $\frac{1}{2}$  day; and Brandywine Valley slides.

"The additions to the program included a practical first aid and water safety session. Unfortunately, the water safety session was conducted for only one camp period. A half day was spent with the Mineral Industries School at the College, visiting the various stations in the Mineral Industries building including meteorology, mineralogy, and geology. On the final evening of the program, the Brandywine Valley slides were shown to two of the four camp groups. It is hoped that the slides can be shown to each group next year as they did an exceptionally fine job in giving the boys a complete conservation conception of what we tried to teach them in a two-week period.

"Colored 35mm, slides were taken by a professional photographer of the camp program. The approximate cost of this is \$150. If it is the wish of the Federation, three sets of duplicates will be made at a cost of about \$25 per set so that four sets will be available for distribution to the various

sportsmen's clubs of the State. The money for this project was taken from the four-hundred dollar grant of the Federation to the Junior Conservation Camp.

### **Recommendations for 1953**

(1) That the same program be continued next year with additional emphasis on special projects for the boys and a slight improvement in some of the techniques used as suggested by this year's camping group.

(2) That the fee of \$35 per boy for the two-week camping period remain the same.

(3) That each division which does not meet its quota be assessed thirty-five dollars for every boy short of their quota provided the total quota of boys is not met.

(4) That the divisions that were delinquent in getting reports to this office by June 1 make a special effort next year to complete the processing of boys earlier.

(5) That, in view of the fact that lack of general interest in the interest Questionnaire has been shown, the Interest Questionnaire be eliminated and that each club sponsoring a boy pay more attention to the type of boy selected for Camp.

(6) That another attempt be made to have a camp for the older sportsmen, but on a weekend period other than the Fourth of July weekend.

(7) That a bulletin on the camp be published."

C. W. Stoddart, Jr.  
State Chairman

### **Pennsylvania's 1952 Duck Release Program**

After it became known that the anticipated Canadian duck eggs would not be received last spring the Game Commission bought all ducklings available in the states of Connecticut, New York and Pennsylvania for liberation on Quaker State waters to further increase the native duck nesting population. The num-

ber obtained was not as large as desired but the prospect of equalling or bettering the 1951 duckling release record in 1953 is promising.

In all, this summer, 2725 ducklings—mallards, blacks and mallard-black crosses—were liberated at 5 weeks of age almost entirely in the northern part of the state. It was there the best results were shown last year.

One of the leg banded ducklings released in Clinton County in 1951 was found, killed by a predator, in the same county in September of this year. This indicates the bird went south last fall and returned to its liberation point this spring. Duplicated hundreds, or eventually thousands of times, the result can be the hoped-for increase in the Pennsylvania nesting ducks.

Everyone who kills or finds a banded duck in Pennsylvania is requested to write the Pennsylvania Game Commission, giving the band number, the reporter's name and address, the location where the bird was killed or found, and the date. Those who make such reports will be advised where and when the duck was released.

### **Do Closed Seasons Save Grouse?**

When the ruffed grouse population nose-dives during the periodical cycle, pressure usually builds up for a complete closure of the hunting season. The results of a three-state survey, published by William Laycock of the Michigan Conservation Commission in the September-October issue of *Michigan Conservation*, indicates that protection has no effect on the recovery when the cyclic trend is reversed. In 1944 Minnesota closed its season for four years; Wisconsin followed suit the following year and closed the season for three years; Michigan preserved the status quo except for a slight reduction in the season and bag limit. In 1948-49 all states had

successful seasons, with Michigan recording the highest grouse kill in its history.

### Violators Learn The Hard Way

The life of the Game Protector can hardly be called a bed of roses, but, on the other hand, the path of the Game Law violator in no royal road to happiness either, thanks to the long arm of the law. A few cases cited below add support to the old adage, "Crime Doesn't Pay."

### Deer Killer Caught After Endangering Game Protectors' Lives

The game protector recognizes that among the hazards of his occupation are the possibilities inherent in the arresting of a law-breaker, particularly at night. These officers are alert to the fact that a person caught in a game violation out of season often becomes panicky at the prospect of a stiff fine, unfavorable publicity and loss of his valued hunting privilege. The guilty one sometimes resorts to violence, even threatens with a weapon. His one aim is to flee or somehow avoid arrest and punishment, but his action often endangers the officer in degree out of proportion to the seriousness of the offense. As a case in point, the following:

About 7 o'clock in the evening of a recent Sunday, rifle shots heard in farming country about 3 miles north of Tyrone were reported to Game Protector Dean Crooks. With deputy assistance Crooks scouted the darkness in the reported Blair County locality, found nothing, waited. At 9:45 p.m. they saw a light played on a deer and heard a single rifle report. Shortly, the officers saw something heavy being lifted into the rear of an automobile standing in a field near woods and outlined against the night sky.

The motor was started and the car, running with lights out, drove onto the road where the uniformed game

protector and his deputy waited. Near the men, its lights came on. Crooks signaled the driver to stop. The response was sudden pressure on the accelerator and a burst of speed. As the car bore down on them the officers were forced to leap aside. By the time they reached their car and gave chase the suspects had eluded them.

But they had caught part of the license number on the auto as it roared past them and had formed an impression as to its probable make and year of manufacture. Evidence uncovered at the scene of the shooting, followed by careful combing of the area around, established the direction the car traveled. Continued investigation eventually led to the location of the get-away auto and its deer-killing owner.

Arraigned before a justice of the peace the man pleaded guilty and was sentenced to pay \$225 in fines, plus the cost of the case. The apprehension and punishment of the cheater satisfactorily concluded this case, but it is well to consider what may have been the outcome had one or both of the game officers been run down by the pre-season deer slayer.

### Gunners Demonstrate Illegal, Dangerous Hunting Method

On October 25, two middle-age men with many years of hunting experience joined the "me first" gang. They went gunning for pheasants—a little ahead of season—in Juniata County.

They hunted along opposite sides of a brush row so dense neither could see the other. A hunting dog flushed a pheasant and the offender fired his shotgun at it and the charge struck his companion, who was in the line of fire. Fine shot entered the victim's chest, hands, neck, and face. At last report the man's condition was said to be "good."

## Night Rabbit Hunting Comes High

Fines amounting to \$380, plus costs, were levied against four young men for unlawfully killing cottontail rabbits early in the morning of October 16, near the Letterkenny Ordnance Depot, Franklin County.

The action started when it was reported to Game Protector Edward W. Campbell, Fort Loudon, that the quartet was hunting at night on a road near the depot. Campbell made the arrest at 2:30 a.m. with the assistance of a Game Commission student officer named Leo E. Milford, who is undergoing field training as part of his education.

When apprehended, two of the defendants were riding the front fenders of the car, ready to shoot whatever appeared in the auto's headlights. Ages of the four violators ranged from 19 to 22 years. Three of the men were committed to the Franklin County jail but were later released when bail and costs were produced.

Among the violations of which this group was guilty were: killing rabbits in close season; using lights to kill game; and carrying loaded guns in a vehicle on highway. They exemplify not only utter disregard for the game law but extreme carelessness on the part of the lawbreakers as to their own safety.

## New Jersey Writes A Price Tag For Imported Rabbits

Rabbits imported from other states for the purpose of increasing local cottontail populations may eventually cost New Jersey sportsmen as much as \$29 each, the Wildlife Management Institute reports.

A preliminary report by the New Jersey Division of Fish and Game reveals that in 1951 about 20,000 rabbits were purchased at a cost of about \$1.36 each for winter release. To benefit the hunter, these cottontails had to survive until they pro-

duced a shootable surplus of young or, at least, until the hunting season. Unlike some state agencies which have stocked rabbits, the New Jersey game administrators began immediately to collect information for evaluating such stocking attempts. Technicians first live-trapped and ear-tagged native rabbits to determine their numbers on selected plots of ground. They then introduced into these areas known numbers of imported rabbits which were also marked to facilitate identification. By observing the rabbits through the spring and summer, and by checking the bags of hunters in the fall, the men were able to chart the survival of both the native and imported animals. Their data indicated very little reproduction by the stocked rabbits, and further, only a few of the imports survived until the hunting season.

Although Missouri does not introduce rabbits from outside its borders, its hunters annually harvest 3,500,000 rabbits in a six-month season. An additional 750,000 cottontails are taken by commercial hunters, and many are sold in other states for stocking purposes. Missouri's fertile farms furnish much ideal rabbit habitat. In New Jersey, significantly, the highest pre-hunting season populations of rabbits were found on a farm which has been managed under a soil conservation plan.

Many states prohibit the importation of live rabbits to avoid introducing tularemia and other diseases and are applying this money and energy saved toward the restoration of suitable rabbit habitat. The numbers of game animals in natural covers are an expression of the ability of the land to support them. Habitat restoration, such as that also being carried on by the New Jersey Division, may not be as spectacular as restocking, but it is less costly and more successful.



U. S. Army Photo

Lieutenant Johns, who in civilian life is the editor of GAME NEWS, receives the Bronze Star Medal for meritorious service from Major General Dulaney, during ceremonies in Korea.

### EDITOR BACK FROM KOREA

This month we joyfully welcome home our editor, First Lieutenant Willard T. Johns, Jr., who has just returned from Korea after eighteen months with the Armed Services. No stranger to "Frozen Chosen", Will spent some time there during his hitch in World War II with an infantry outfit. Following his recall to duty in June 1951 he once again found himself on that embattled isle, where he experienced everything from front line reconnaissance to instructing. At the time of his discharge he was operations officer of the intelligence section of the division headquarters, in which capacity his painstaking efforts earned for him a cita-

tion for meritorious service.

During his absence Will's wife, Vivian, was seeing to the final construction of a new house in Hershey that was just begun when the army claimed her husband. The couple and their two children expect to call it home in the very near future.

In the Lieutenant's absence all of the editorial work, along with art requirements were furnished by Ned Smith, who did a splendid job under all sorts of handicaps. As a reunited team these two associates will put their all into future issues of GAME NEWS in an effort to maintain the high standard it truly merits.

. . . The End.

## Michigan Attacks Its Deer Problem

The Michigan Department of Conservation has been granted legal authority to manage scientifically the deer herd in the Lower Peninsula for a three-year period, the Wildlife Management Institute reports. A special hunting season has been set to harvest antlerless deer in areas where they are overabundant. The Michigan wildlife administrators state that it may take a period of several years to bring about a proper balance between the numbers of deer and the food supply in problem areas.

Problems that arise from an overabundance of deer include starvation in the wintertime, and damage to forests, orchards, and field crops. Michigan game technicians recently presented information which discloses striking differences in the welfare of deer on properly and improperly stocked ranges. Doe deer from overstocked, and consequently overbrowsed, areas were found to bear only one fawn each year, but does from areas where a proper balance exists between the deer population and the food supply averaged two fawns annually. Three-year-old bucks from depleted ranges averaged fifty pounds lighter in weight than animals of similar age from a prop-

erly stocked range. Bucks from the overstocked areas also grew smaller antlers with fewer points.

Many states, along with Michigan, have had experience with this problem. The results of their individual investigations agree with those of Michigan in that deer herds do not thrive on ranges where their numbers exceed the supply of food. An oversupply of deer is the direct result of inadequate hunter harvests. Deer which could have been utilized by sportsmen fall instead to starvation and disease, a deplorable situation in scientific game management. The blame lies largely with the current method of forming game regulations rather than with the state game officials. No more than half of the game departments of the states and Canadian provinces have the legal authority to set hunting seasons and bag limits, and not all of these agencies have complete freedom of action. Too often the hunting regulations are promulgated without regard for the biological principles that form the most sound base for reasoning. The sportsmen themselves are beginning to recognize these facts and are joining with the state game departments in urging more widespread recognition of modern game management techniques.

## VANISHING SPECIES

The International Union for the Protection of Nature has announced that three North American birds are included on the list of thirteen listed as vanishing species. These are the California condor, the Eskimo curlew and the North American whooping crane. The latter is the subject of much interest and energetic efforts are being made to help this species survive. It is exceedingly difficult to devise effective management practices in behalf of this bird, due to its wariness and the very small number of individuals that are known to exist, but efforts continue.

Other threatened species are the Arabian ostrich, Hawaiian goose, New Caledonian kagou, Indian pink-headed duck, Australian ground parakeet, Laysan duck, Marianas mallard, Cuban ivory-billed woodpecker, Bermuda petrel and Marianas megapode. The most recent species of North American wildlife to become extinct was the heath hen, the last specimen of which died on Martha's Vineyard.

Fourteen mammals are listed by the Union as being in dire straits. These are the Javan one-horned rhinoceros, the Indian one-horned rhinoceros, Asiatic lion, Burmese brow-antlered deer, giant sable antelope, North African bubal, Tasmanian wolf, marsupial banded anteater, wisent, chinchilla, mountain zebra, Caribbean monk seal, Addo bush elephant, Cuban solenodon.

# Pennsylvania Official 1952 Open Seasons and Bag Limits

Open season includes first and last dates listed, Sundays excepted, for game.\* The opening hour for small game on November 1, buck hunting on December 1, and antlerless deer hunting on December 15 will be 9:00 A. M. Otherwise, upland game shooting hours daily are from 7:00 A. M. to 5:00 P. M., but from July 1 to September 30 inclusive, 6:00 A. M. to 7:30 P. M. (All shooting hours based on Eastern Standard Time.)

BAG LIMITS			OPEN SEASONS		
	Day	Seasons	First Day	Last Day	
UPLAND GAME (Small game possession limits below)					
Bobwhite Quail .....	4 .....	12 .....	Nov. 1 .....	Nov. 15	
Ruffed Grouse .....	2 .....	6 .....	Nov. 1 .....	Nov. 29	
Wild Turkeys (see counties closed below)* .....	1 .....	1 .....	Nov. 1 .....	Nov. 29	
Ringneck Pheasants, males only .....	2 .....	8 .....	Nov. 1 .....	Nov. 29	
Rabbits, Cottontail .....	4 .....	20 .....	Nov. 1 .....	Nov. 29	
Squirrels, Gray, Black & Fox (combined) .....	5 .....	20 .....	Nov. 1 .....	Nov. 29	
Squirrels, Red (closed October only) .....	Unlimited .....		All mos. except Oct.		
Hares (Snowshoe Rabbits) .....	2 .....	6 .....	Jan. 1 .....	Jan. 10, '53	
Raccoons, by individual or hunting party* .....	5 .....	{ 40 .....	Oct. 15 .....	Feb. 1, '53	
Raccoons, by trapping .....	5 .....	{ 40 .....	All mos. except Oct.		
Woodchucks (Groundhogs) (closed October only) .....	5 .....	Unlimited .....	Unprot. to Sept. 1, '53		
Grackles (unprotected) .....	Unlimited .....		Nov. 17 .....	Nov. 22	
Bears, over one year, by individual .....	1 .....	1 .....	Nov. 17 .....	Nov. 22	
Bears, as above, by hunting party of three or more .....	2 .....	2 .....	Oct. 15 .....	Feb. 1, '53	
Bow and Arrow Season—Male with two or more points to one antler (requires hunting license and special archery license) by individual* .....	1 .....	1 .....	Oct. 13 .....	Oct. 25	
DEER: { Regular Season—Male with two or more points to one antler, by individual* .....	1 .....	1 .....	Dec. 1 .....	Dec. 13	
Antlerless Season—(requires hunting license and antlerless deer license) by individual* .....	3 .....	3 .....	Dec. 15 .....	Dec. 17	

NO OPEN SEASON—(Hen Pheasants, Hungarian Partridges, Cub Bears, Elk, Spike Bucks and Otters.)

#### FURBEARERS:

Skunks and Opossums .....	Unlimited .....	Unprot. to Sept. 1, '53
Minks .....	Unlimited .....	Nov. 5 .....
Muskrats .....	Unlimited .....	Nov. 29 .....
Beavers (traps only), state-wide* .....	3 .....	Feb. 16 .....
	3 .....	Mar. 7, '53

#### \* SPECIAL REGULATIONS

**POSSESSION AND TRANSPORTATION LIMITS** of legally-killed small game shall mean not more than the daily limit for the first day nor more than an accumulated total for each succeeding day of the open season for each species; but not in excess of the season limit, regardless of where held, stored or found in possession.

**TURKEYS, COUNTIES CLOSED TO HUNTING**—Adams, Armstrong, Butler, Fayette, Greene, Mercer, Somerset, Venango, Westmoreland and York. In addition, that part of Cambria west of Highway Routes Nos. 271 and 56; that part of Cumberland south of U. S. Highway Route No. 11 to the west shore of the Susquehanna River; and that part of Franklin south and east of U. S. Highway Route No. 11 are closed.

**RACCOONS**—Hunting season begins at 7 A. M. on the first day, and ends at noon on last day (see instructions below concerning trapping). May be hunted day or night, Sundays excepted. The season limit applies to hunting and trapping combined.

**DEER**—Even though there are three separate seasons for taking deer, a hunter may not kill more than one deer during the three combined 1952 seasons, whether hunting individually or with a camp or hunting party. A Special Archery License is required during Bow and Arrow Season, issued only by the Dept. of Revenue, Harrisburg, at a fee of \$2.00. Antlerless Deer Licenses are issued only by County Treasurers, at a fee of \$1.15, and valid only in the County for which issued. Farm occupants permitted by law to hunt without a license may also hunt for antlerless deer during the antlerless season on the same lands as for other game. See Digest issued with hunting license for details. Under the law, no application for an Antlerless Deer License shall be approved, or license issued, to a Nonresident prior to November 15, or after December 14, 1952.

**BEAVERS**—No trapping at Commission-posted dams. Nonresidents may not trap beavers. One person may set, tend or operate 10 traps only. Traps must not be set on the structure of any beaver dam or house, or within 25 feet of the waterline on the structure of either thereof. Tags must be kept above ice or waterline to facilitate identification without disturbing traps. Pelts must be tagged within 10 days after season, and may not be sold or otherwise disposed of until properly tagged. Present them to the Game Protector in District or County where trapped.

**TRAPPING**—Traps for furbearers and raccoons not to be placed, staked or set before 7 A. M. on the first day of the open seasons. The season indicated for Trapping closes at 12:00 o'clock Noon on last day. Traps must be tagged with metal name tags.

**SNARES**—The use of snares is prohibited in all counties except by special permit.

#### REGULATIONS FOR UPLAND GAME FIXED BY PENNA. GAME COMMISSION AT MEETING JULY 1, 1952.

1952 HUNTING LICENSE IS VALID SEPT. 1, 1952 TO AUG. 31, 1953, BOTH DATES INCLUSIVE.

# CLUB NOTES

## Calling All Clubs

By Theodore R. Specht

IS your club "Just fading away?" Are your members becoming fewer and fewer each year?

A well organized youth program is the answer to your problem. If your club is falling apart, it may be dying off at the top. As older members leave the organization, who is to replace them? The answer is obvious. It's the young blood of the club that will inherit its benefits and govern its progress. Look at your club. How many members do you have under twenty-one years of age?

Stimulate interest in your activities by inviting the youth of your community to join. Have special projects that you know will interest them. Instruct and guide them into being the kind of members who will be an asset to the club. You will find, surprisingly enough, that many of your old members will take a renewed interest in aiding the youngsters.

For an example, The Pittsburgh Casting Club, of which I am a member, sponsors a program for boys and girls up to sixteen years of age and

*These trophies and prizes were contributed by the Pittsburgh Casting Club, the Rotary Club of Lawrenceville and local merchants.*



so far it has been very successful. The Pittsburgh Boys' Club has accepted accuracy casting as a summer camp activity.

Each year a tournament is held for the youngsters. Boys and girls alike compete for trophies, medals and prizes which have been displayed in the local merchants windows. Movies are taken and snapshots sent to the local papers.

Clubs from other states were invited to send entries to this year's tourney. Response was good. The idea has taken hold and is fast becoming a popular project of clubs in neighboring states. Inter-club and inter-state competition will encourage the development of new talent and reawake the old.

Have each of the older members of your club select a youngster and instruct him on the club laws, aims and skills. If yours is a gun club, you might teach the proper handling of firearms, game conservation, tracking, sportsmanship and marksmanship. Many youngsters will find this interesting and educational. Have tournaments to decide who has become most proficient. Display the prizes well in advance of the tourney. You can't expect youngsters to become enthused over a promise; let them see what they can win. You'll have to spend some money, but the reward is well worth it. Child delinquency is purchasable and to save just one child is well worth the price.

Spend a little time planting the seeds and pruning the saplings. The boys and girls of today are the future of your club so why not begin now to prepare for that future.

. . . *The End.*

#### Hellertown Sportsmen's Association

This Club's October meeting known as "Farmers' Night" is usually the big sendoff meeting prior to hunting season. Farmers of the townships and surrounding areas are invited to attend and spend an enjoyable even-

ing with us. There are eats and refreshments, motion pictures, free literature, and displays on hand for everyone's enjoyment. Farmers are given safety zone signs.

The speaker for this year's Farmers' Night was Johnny Daday, sports announcer for WGPA radio station, Bethlehem, Penna., who spoke on safety of firearms and hunters' problems in general. The motion pictures "Shooting Safety" and "Whistling Wings" were shown.

#### Decatur Sportsmen's Association

Although not a large club, a substantial percentage of the Decatur Sportsmen's Association's one hundred members must be active in every sense of the word. According to a report by their president Glen J. Weader these sportsmen have racked up an impressive list of accomplishments, including the establishment of a route of two hundred basket type feeders along Shade and Jack mountains, the rearing and release of ring-neck pheasants under the day-old pheasant chick program, the forming of several small game refuges on abandoned farm land and the planting of Chinese chestnut trees.

#### Aliquippa High School Club

Conservation for the sportsman has become more than just words to a large group of students in Aliquippa High School.

There, thanks to the efforts of Instructor Larry Blaney, former Assistant Football Coach, the group is called "The Conservation, Hunting, and Fishing Club." Members are required not only to learn the best methods possible in conservation and hunting and fishing, but also to practice what they preach.

The members also aren't content merely to sit in a classroom and hear speakers tell of the great out-of-doors. That's where the fun begins! A great majority of the members spend their free time in fishing and hunting. Needless to say, conservation of the

nation's resources, both animal and mineral, is foremost in their minds during one of these expeditions. Members of the organization also have decorated Larry Blaney's home room, Room 214, with various and sundry literature relative to the Club's interest.

Officers of the Club include Ray Fuss, President; Tony Pandaleo, Vice President; Peggy Abee, Secretary; Darlene Fuss, Treasurer; and Jim Miller, Sergeant-at-Arms. Larry Blaney acts as Sponsor.

Sponsor Blaney and the Club itself have received highly creditable press notices from newspapers and magazines throughout the district. Membership isn't restricted in any way, shape, or form. Any high school student may become a member in good standing merely by attending the meetings. The only requirement is an interest in the Club's work.

*The CONSERVATION, HUNTING AND FISHING CLUB, of Aliquippa High School, and the classroom it decorated with literature and pictures relative to the club's interests.*

Photo courtesy of Men and Steel

### CEA Offers Tips to Clubs

Robert D. Parlaman, Conservation Education Assistant in our Northwest Division, has picked up a number of good pointers on sportsman's club activities. Recently he sent to us two ideas that seemed especially worthwhile and they are herewith passed on to our readers hoping that they might be applicable to their own clubs.

The first concerns the sale of deer hides as a source of revenue for the sportsman's club. Bob enclosed a copy of the *Titusville Sportsman*, official publication of the Titusville Sportsman Club, in which donors of deer hides were listed. These hides were sold, as currently permitted by law, to bolster club finances.

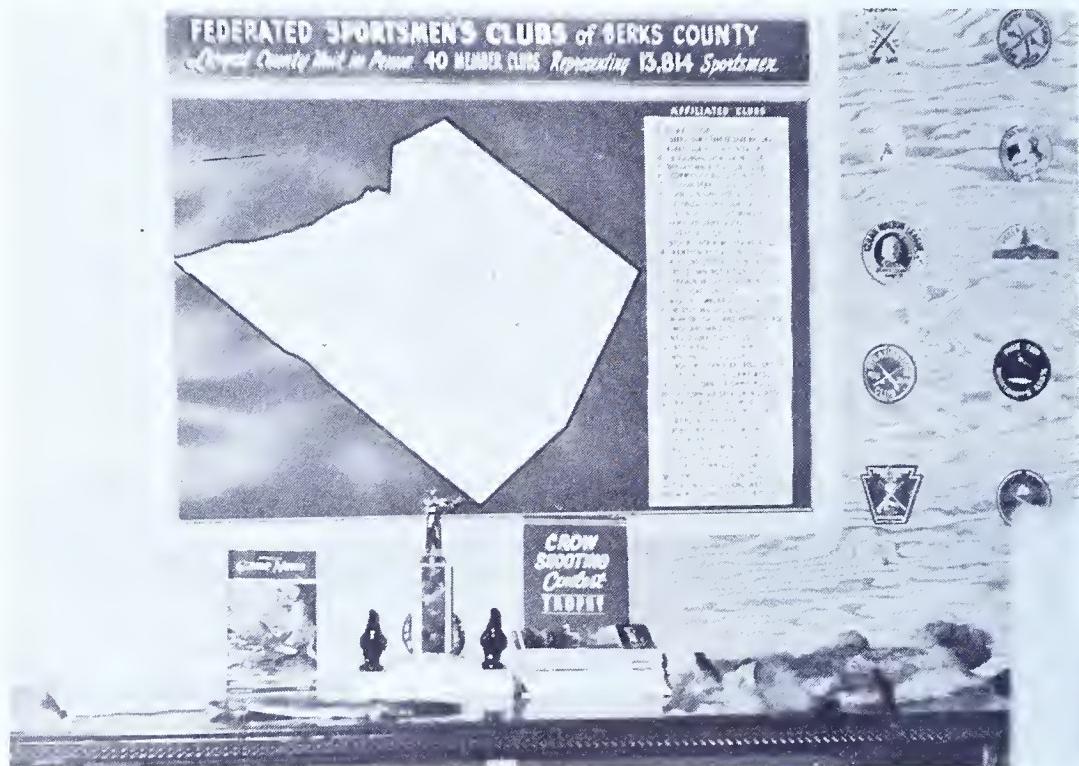
Bob also passed on a very worthwhile tip for those clubs that find interest lagging because of long, drawn-out business meetings that con-



sume a large part of the evening programs. To remedy this situation many clubs invest the necessary powers in a board of directors, officers and committee heads. A separate business meeting is held periodically and, although *all* members are invited to attend, only these officers and directors are obliged to do so. The regular meeting is held on another night, the fellowship and entertainment unmarred by a lengthy business session.

### STOLEN GUN

On Sept. 18 a .30-30 Winchester rifle, model 94, was stolen from the house of Alfred L. Simpson, 320½ Church St., Sunbury, Pa. The serial number is H1630137. The owner would greatly appreciate any information on the whereabouts of this rifle.



*As part of their display at the Berks County Sportsman's Show, the Federated Sportsmen's Clubs of Berks County exhibited this splendid trophy to be given the winner of the crow shooting contest and a map showing the locations of the forty clubs in the county.*

Bees are more ill-tempered in foul weather than they are on fair days.

\* \* \*

The roots of most trees are more extensive than the branches. In fact, with most plants, except those that grow in swamps, there are more underground parts than parts above ground.

Mammalogists recognize 253 different species and sub-species of land mammals east of the Mississippi in the United States. There are about 30,000 in the world.

\* \* \*

In September, 1632, Virginia became the first state to enact a law protecting game.



Dear Son:

Tonight I shall write you further reminders of your summer on McGregor Bay. You have no idea how much pleasure the writing of these letters is giving me. Started with a view to pleasing you, I am getting a real thrill from them myself. The very searching of my memory to set down things for you is helping me to relive experiences that were great fun at the time—and now are doubly so in retrospect. I hope you also may so find them. To be able to do so, my son, is one of the crowning satisfactions of a sportsman's life.

I remember that we did not leave Carl's cabin during our first week there. Then I planned a little trip for you to Long Lake—a trip Carl Loy had told me of, but that he and I had not taken. There are just two ways to get in or out of Long Lake. One is to go by way of Kirk Creek from McGregor Bay, which requires a total of eight portages; the other is to go in by way of Bay Fin, with one long portage of two miles over

the top of the mountains. Thus the silent shores of Long Lake are pretty effectually protected from the outside world. One might be there for a year and never see another soul.

We got a fairly late start the morning of our departure and then somehow got into the wrong prong at the eastern end of McGregor Bay, with the result that we missed the mouth of Kirk Creek and spent three hours trying to find it. About noon, however, we were successful. Kirk Creek is so narrow that in many places the trees overhead almost meet. For one who loves to paddle quiet streams, Kirk Creek will fulfill the heart's desire—except maybe for those eight portages! The saving grace of these is that none of them is long.

We had lost so much time both by our late start and in trying to find Kirk Creek, that it was alarmingly late before the eighth and last portage had been passed—and there lay ahead of us the winding waters of Long Lake. In fact, the hour was nine p. m. and we still had supper to get

and camp to make. The first available spot that offered any possible chance for pitching camp was what we had to accept without being too particular—and this spot proved to be a very wide and none too flat rock. I have never in my life slept more uncomfortably than that night—or have I any right to use the word *slept*? I didn't sleep at all. I couldn't. I could only roll from one bruised spot to another. Yet thus being kept awake had *one* advantage. It was a splendid opportunity to get right down to "bed rock" and ruminate upon certain of the real fundamentals of life. I recall that I did considerable thinking that night. Suddenly I heard a crashing through the brush and a deer came bounding by the very rock on which our tent was pitched. It was being chased by wolves and was making for the lake, into which it jumped headlong from the top of our rock with a tremendous splash. You slept through it all!

Next day we reached the far end of Long Lake. During that day we had determined upon one definite decision—namely, that at promptly six forty-five, no matter where we might be at the time, we would start looking for a suitable place to make camp. It was about fifteen minutes earlier than the appointed hour when we passed a tiny island that attracted our attention, and we pulled up the canoe and stepped ashore to investigate. Some divine hand must have guided us! We found ourselves in the midst of blueberry bushes growing low to the earth. Our camp for the night was decided upon. We pitched the tent right on the softest bushes. No mattress ever sank down more restfully than the bed on which we bunked that night. We slept late the next morning. Even our breakfast tasted better for the rest, and the day seemed brighter because of those blueberry bushes. They furnished us both a soft bed and good food.

Before starting down Kirk Creek on our way home, we climbed the mountain that looks into Bay Fin; and from the top of that mountain we looked west and took a picture of McGregor Bay; then turned east and took a picture of the winding waters of Long Lake.

Three of the portages in Kirk Creek are caused by tiny waterfalls and we saved considerable time in returning by getting out and letting the canoe go through with the duffel aboard. We had already passed two of these so successfully that you began coaxing me to go through ourselves on the third and last of these. But there was safety to be thought of—if the canoe should spring a leak, we would have been miles from possible assistance. I was standing along the steep rocky edge of the bank, studying the situation, when suddenly my feet went out from under me and I was deposited abruptly in the water. The canoe shot through without mishap, much to my surprise and satisfaction. In fact, it went through so nicely that, especially since I was wet anyhow, you pleaded even more strongly that we unpack the duffel, carry the canoe back again, and ride through in it.

Nothing of particular note happened during the rest of the trip—except that coming out of Long Lake we saw a total of fourteen deer from sunrise to sunset. But it's pretty hard to get a good picture of a deer in summer. You must have the proper light; the wind must be right or you can't get close to the deer; and other conditions must be perfect. It's somewhat like shooting grouse—you have to take your chances as they come, and simply hope for the best. But you were so anxious for a picture of a deer!

Then—just as we were leaving Kirk Creek—we suddenly saw a family of three deer standing fairly close together. It was our last chance, and we had nothing to lose, so I paddled

straight in towards them, and you kept taking pictures, one after another, on the gamble that one of them might turn out all right. One of them did—and you got a picture that shows all three of those deer.

As my mind drifts back, I think of another little thing of which I want to remind you. I had taken along with us a copy of Dr. Charles Eastman's book, "FROM THE DEEP WOODS TO CIVILIZATION," and read it to you during our month on McGregor Bay. Dr. Eastman was a full blooded Sioux Indian who had been but a little boy when his people had defeated General Custer—but he remembered it. I had met him, and so did you, when he came to Dayton to entertain the Boy Scouts; and I afterward drove him to Troy where he spoke before the Rotary Club there. He was a fine character—a splendid man. We corresponded for some time. He was a graduate of Dartmouth and our library contains autographed copies of several of his books, among them "THE SOUL OF THE INDIAN," which you have read. Every American should read it. But it is of something in the first mentioned book that I would remind you now.

When Dr. Eastman (he wasn't Dr. Eastman then) made up his mind he wanted an education, he met stern opposition from his old grandmother who had raised him after his mother's death. His father was not against it, but his grandmother fought hard to keep him to the ways of his people. Do you remember what he wrote of saying that frustrated her opposition? It was this—

"But, Grandmother, you are going against the precepts of your own teachings, namely: 'Whenever you come across something you do not understand or a trail you do not know, follow it to the point of knowing'."

He had her there—but, as she finally gave in, she warned: "Well, my

son, be mighty careful that you don't get lost in this new trail."

It has begun to seem to me lately, my boy, that a good many of us in this world have gotten "lost on this new trail."

Have you ever contemplated how curious it is the way many of us yearn most for things we do not have? I think of Art Kitchen that summer as an extreme example. One day I happened to tell him how much I envied him living where water was everywhere—and such wonderful water, with unlimited boating and canoeing.

"Pshaw," he said, "but you have automobiles."

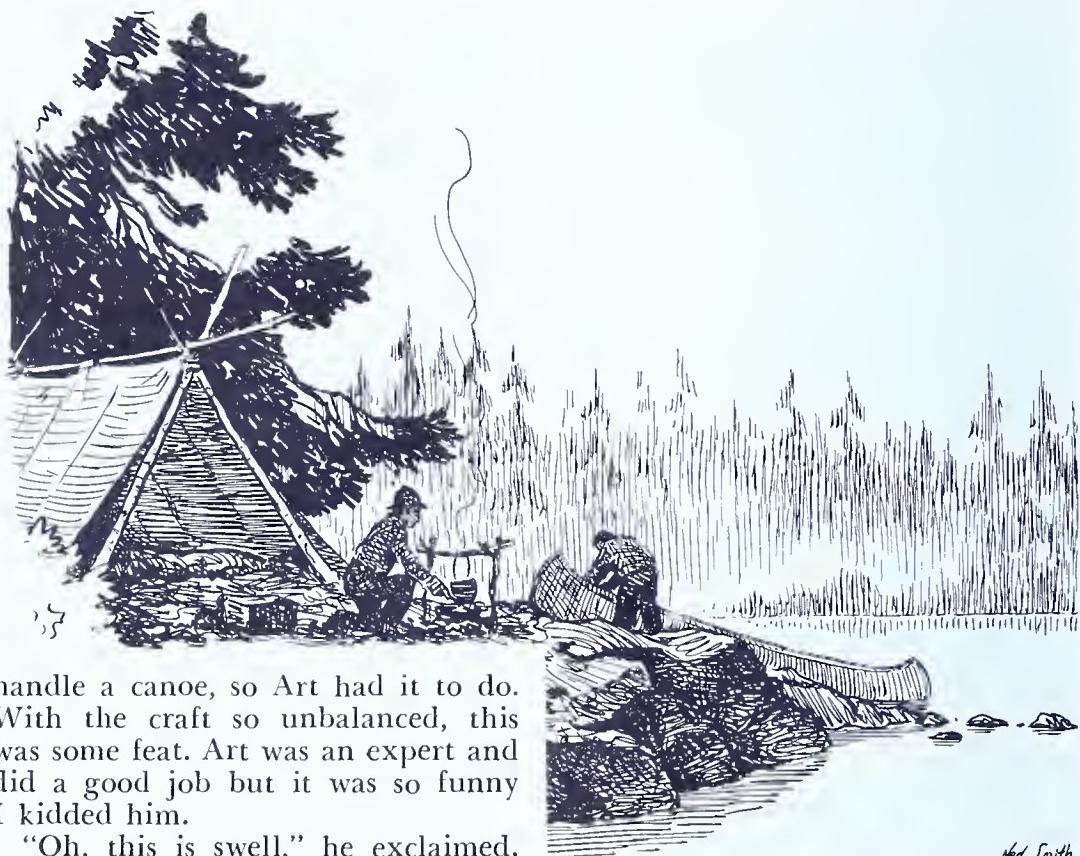
"There's no use for one here," I said, "and I'd ten times over rather have a motor boat—and a canoe."

"I wouldn't," he amazed me by saying. "I'm saving up now to buy a car."

"But there's no place to use it," I said. "You could drive it but a few hundred yards in Little Current; and there's only one road on the whole of Manitoulin Island. All you could do would be drive back and forth on that one very limited road—and you'd soon get mighty tired of that."

"No, I wouldn't," he insisted—and that was that. In those days the only way to get to, or from, Manitoulin Island was by train or boat. Since then a highway has been built. I suppose Art now has a car if he still lives there. I wonder, too, if cars still lure him as they did then. I wouldn't know. I've never seen him since that summer. I'd like to—for I liked him. He was a nice fellow, and lots of fun.

You'll remember the day some friends of the Kitchens came out from Little Current to see them. One was an awfully fat and heavy young girl. She was almost twice Art's weight. We went out in the canoes and it fell to Art to take her. Being so much heavier, she should have paddled stern. But she couldn't



handle a canoe, so Art had it to do. With the craft so unbalanced, this was some feat. Art was an expert and did a good job but it was so funny I kidded him.

"Oh, this is swell," he exclaimed, "she throws me so high in the air I'm paddling *down hill* all the time!"

I have seen two sunrises in my time so majestic as to beggar description. One was some years ago on the Saskatchewan prairies. The other was the morning you and I left Carl's cabin that summer. Art had offered to take us to Little Current in his motor boat, where we were to catch the Manitou for our return trip down Georgian Bay. But, to make connections, we had to leave at daylight. This meant being up long before that. You and I were so much ahead of time that we had a chance to watch the wilderness sunrise while waiting for breakfast. I have never seen anything even remotely to touch it in all my life.

First, there was a faint—very faint—reddish tinge in the East. Slowly it seemed to expand, as when a toy balloon is inflated. Gradually the Eastern sky became redder and redder and redder. Suddenly the golden Sun peeped out over the forest. The

waters of the Bay were lit up by glancing colors that no rainbow I have ever seen could match. The enchantment of it all held me in a spell—a spell that lingers still as I write this to you. I hope you remember it yourself. I hope it sank deep into your very soul as dawn broke that morning over woods and water. I hope this because I have made but a feeble description in trying to remind you of it. But only God Himself could paint a scene like that!

One final memory before I close for tonight: After a month of my tin-can cooking, you and I mutually shared a craving that we could not satisfy until we reached Little Current—but did promptly then. That craving was for ice cream. We each had two ice cream cones as soon as we could get them. Oh, how good they were—or seemed! Remember?

With best love always,  
DAD

# A Camp Cook Comes Home

THIRTY-FIVE years ago Mary Crawford, a lumber camp cook in old Potter and Tioga county, left her beloved Pennsylvania and went to the Catskills to live. This year she returned and was delighted to find the denuded mountains once again green with thriving forests and teeming with game she had never known in her youth. Now seventy-six years young, she paints a verbal picture of lumbering days in Penn's Woods in the following letter to the editor:

"I am an old lumber camp cook. I spent 14 years cooking in the large lumber camps in Tioga and Potter County in Pennsylvania, after which I went up in the Catskill Mountains in New York State to live. After thirty-six years I have come back to good old Pennsylvania to end my days, and am amazed at the changes made by the State Conservation

Commission. Recently I went to Croton Point on a picnic, and if everyone could look back like I did on that country and see the vast forest of hemlock and pine they would wonder how men and horses ever got rid of it, and in its place nice roads, and camps, hard wood forests, and game of all kinds.

"I had a lumber camp not far from the lookout at Croton Point and the nearest railroad station was at Tiadaghton, Pa. To go to the bank at Wellsboro, Pa., to get cash to pay our men every month I walked four miles from Slide Island to the railroad, climbed down that mountain on an old logging road to what is now the Grand Canyon,

*The H. R. Whitaker camp at Conrad, Potter County, which was moved from the Lushbaugh and set up the same day. Miss Crawford, third from left, cooked for this crew.*



and got my train to Tiadaghton. I came back into camp all in one day with a big lot of cash in my bag and I never saw a deer, only one bear and no wild turkey in all those years I traveled those woods alone.

"From Croton Point we went to the lookout on Buck Run Mountain, and what a sight—it is beautiful beyond expression to look over the

tops of all the mountains and for me who spent my young days among them it sure was a thrill. My nephew who is a devoted hunter and fisherman and knows that country so well and loves it as I do, sees to it that I get a trip through some new section of it each summer and I hope it lasts.

Mary Crawford,  
Westfield, Tioga Co., Pa.



## *Lost In The Mountains*

By John F. Boyle

"**L**OST in the wilds of Pennsylvania" may sound rather facetious, but to one who has experienced just such a predicament, it is no joke. Although Pennsylvania is one of the most thickly populated and highly industrialized states, it has twelve million or more acres of forest land. Huge stretches of wasteland, swamps, "dismal tarns and pools," and wide ridges, make being lost a serious affair. I know from experience what it means because in 1947 it happened to me in Lycom-

ing county, near Jersey Mills. By following a mountain stream into Pine Creek, I was able to find our boarding house, Creekside Inn, without mishap.

With hundreds of thousands of big game hunters, most of whom live quiet, sedentary lives the rest of the year, roaming the rugged mountain country during the big game season, we should thank a kind Providence that more are not lost.

After the close of last year's deer season, my friend and neighbor, Harold Goldate, had the following harrowing experience to relate:

"The first day while hunting with a party of four others, I wounded a good-sized buck, but as it was getting late I couldn't follow it very far. The next day, however, the same five of us started out, and when we came near where I thought I had

wounded the buck I looked around for tell-tale signs. Sure enough, I found blood marks and a trail! I told the fellow nearest me that I was going to look for my buck. As the trail lay almost parallel to the way of the drive I thought I'd have no trouble finding my companions again—besides I wanted to try my hand at tracking. I could hear the shouting of my party for awhile then it died away. So did the trail. Nothing I did gave me a clue as to what had become of my deer so I gave it up and hurried off to rejoin my party. I was unsuccessful in that attempt, too. After two hours or more I decided I was lost as far as they were concerned and I would try to get back to camp the best way I could.

"I looked for a stream to follow, the way you told me you had done. Found one, too, but it led such a meandering course over a wild, dreary swampland that I was afraid of sinking into the mire, so I back-tracked to where I started. Then I tried to cross the mountain. Lucky for me I only climbed over a spur and found myself on the same side. If I had reached the top there would have been a "flat" that extends for miles and they might never have found me alive.

"I did not become panicky but thought it about time to give the distress signal—three shots in rapid succession—which I did at intervals. I found a smaller stream that flowed through the valley, and following it came upon a waterfall of such remarkable beauty that, even in my somewhat dangerous predicament, I could not help but admire it. The going was so rough that it became necessary to cross and recross the stream, my boots making a cracking noise on the frozen rocks.

"It began to snow and was getting dark, so I thought I'd bed down for the night. A shallow cave looked inviting and I collected wood and

tried to make a fire, but the wood was so wet I didn't succeed. I also discovered what looked to be bear tracks, and, as I had no wish to test bruin's hospitality, I thought it best to move on. There were also tracks that looked like a wildcat's. I was beginning to feel tired so I said a prayer. I felt better immediately.

"Soon I heard shots and shouts in the distance and I answered them with vigor. By following the sounds I came in sight of another hunter, coming down the side of the mountain to meet me. We greeted each other with the same salutation: "Am I glad to see you." We were a little disappointed when we found out we were both lost but two heads are better than one, and together we got a fire started.

"He was an ex-marine, but I forgot his name. One thing on which we both emphatically agreed was that never, under any circumstances, would we ever go hunting again. We tried to get some sleep, one sleeping while the other watched, but did not succeed. We fired one shot now and then instead of the usual three, so as to conserve ammunition.

"Around 2 a. m. we heard shots and shouts, and answered enthusiastically. The rescue party reached us in a short while, led by the light of our campfire as well as our shouts. They had some hot coffee in thermos bottles and a few sandwiches. Then we were hurried off to the boarding house. Here we found a hot supper awaiting us, but my companion refused. "No," he said, "I want to get as much sleep as I can. Tomorrow I'm going hunting."

This is the gist of my friend's story. I asked him if he on his part was ready to keep his promise to give up hunting. His answer will not surprise any real dyed-in-the wool hunter:

"I can't wait until next year's deer season."

. . . *The End*



By Herbert Kendrick

**W**HEN autumn's golden days appear and the heavy frosts transform the hillsides and valleys into a hunter's wonderland, the crowning climax is reached when a beautiful well bred and carefully trained bird dog covers a birdy area with his head high and his tail swinging merrily. In a sudden moment, his nostrils become filled with the glorious scent of a ruffed grouse. He stops immediately, walks stiffly yet gracefully for a few yards and freezes into a perfect point. You know the bird is hidden only a few feet from his accurate nose because constant association with the animal has made you rely on his great finding and handling ability. With a racing pulse and your heart in your throat, you walk past your statuesque canine companion as the brown bomber explodes from the leaves and bursts through the masses of tangled vines and second growth. Your gun automatically jumps to your shoulder, you catch a glimpse of a brown flash down the barrel, and you squeeze the trigger, then midst a little cloud of floating feathers the brown flash drops to the ground. You thrill to the familiar thud that makes every bird hunter's heart skip a beat. At command, the faithful dog moves in swiftly and straight to the prize. He lifts it gently, then carefully retrieves it for his master. This is outdoor hunting perfection which represents weeks, months, and even years of careful planning and strenuous training. This beautiful picture does not just happen by reason of chance or luck. It is the deserved reward of the man who is farsighted, ambitious,

# The Value of a Gun Dog

and sportsman enough to go through the trouble involved in selecting a well bred pup, and going through all the phases of training that make a dog worthy to be called your hunting partner.

The modern gun dog logically belongs second only to the game bird itself, because he is by far the most important adjunct to the sport of gunning. The upland game hunter can easily, in normal times, buy a new gun, a new car, new hunting clothes, or improved ammunition—all on short notice, but the process by which he possesses a superlative dog is very slow and many times uncertain.

Grouse, pheasant, woodcock, or quail hunting without a dog is just not bird hunting at all. At the present time, any man who knows and loves bird shooting, if he were given a chance, would rather go into the autumnal covers without his gun than without his dogs. Even in the market hunting days, which we would like to forget, the dog was a very necessary part of the hunter's outfit.

The past decade has shown us that the upland gunner has become more conscious of dog character. In the woods and fields the dog has become the hunter's close associate and partner, providing all the companionship that good men require. Many people fail to realize the deep feeling that exists between man and his dog when they learn to hunt together. Even though a hunter has friends with whom he loves to be and hunt with pride, he does not remain home on a clear crisp day for the lack of human companionship.

Hunting with a good dog during the open season is the very essence of the fine sport, and because the season lasts only a month, many men continue to follow game with their dogs, thoroughly contented to watch the work and continuous training with no sense of loss because the gun is left at home.

A rapidly growing interest in gun dogs must be regarded as beneficial to game conservation. The more attention given to owning better dogs, the more interest is created to have more birds on which to work them. Then during open seasons a well trained dog forced to retrieve will almost entirely eliminate the loss of dead or wounded game, which a gunner cannot locate. Some states are

now considering measures to require a hunter to have a retriever when hunting winged game, because of the severe losses sustained by men who hunt dogless.

Far too many hunters are hunting small game in our state without the aid of a good dog. The purpose of this column is to impress upon our readers the necessity of owning and using a first rate bird dog. We shall attempt to create the desire of ownership, then discuss puppy selection, dog breeding, all phases of training, and relate story after story of unusual performances, exciting experiences, and hopes for future fun in the field.

. . . *The End.*





By Ed Shearer

**A** careful survey over the years shows that probably eighty to ninety per cent of all deer shooting is done in the offhand position which is the most difficult to master.

Judging from personal observation of several thousand hunters over the years not more than ten per cent can claim this distinction. This leaves the great majority employing a shooting position that is beyond their ability at any distance but bayonet range.

I marvel at the sublime confidence of deer hunters who never fire their rifles except maybe for a few desultory shots between seasons. Theirs is the faith from which zealots and martyrs are born. They firmly believe that they possess some inherent ability which will direct the bullet unerringly if the rifle is "shootin' right." Then they assume the toughest position because nobody ever showed them an easier one.

An example of this was a hunting club I belonged to for many years. We spent most weekends through the summer at the camp. On one of these occasions we inaugurated a new system. All camp chores were to be decided by a shooting match of from one to five shots. Further (and here was the joker) a man could shoot from any position he desired.

Every task from washing the dishes to carrying a bucket of water from the spring was cooked up. I grin yet when I recall how fast that club really began to think in terms of "hittin' what they shot at." By fall the deer agreed that things were getting serious in that locality.

## The Offhand Shot in the Woods

By the next summer prone shooting was barred and offhand was stepped up with enough sitting positions allowed to remind the brothers that no law existed that required you to shoot a deer offhand. By fall they had become the "shootinist club" in all that country. Any buck that gave any one of that club a half way decent chance stood in grave danger of having his interior redecorated.

All this at a cost of from five hundred to one thousand .22 caliber cartridges per weekend. The individual cost ran about the price of one modest hand of poker and the good natured ribbing of the gang as he performed the menial tasks his lack of skill imposed upon him.

What can the average deer hunter who has no ambitions to become a target shot, and whose opportunities for practice are limited, do to help himself? For a start let's throw away the manual and proceed with the idea of committing mayhem on a deer at 50 yards with the least possible fuss and time. You discover there are two things that you must circumvent. The first is gun wobble. The front sight seems to wander all over the scenery. So you tighten up your grip, determined by main strength and awkwardness to hold it still. It wanders worse than ever.

The second hurdle is pressing the trigger so that the gun is discharged when the sights are lined up with the target without imparting further movement. The problem is to slow down the movement enough to give you a chance to complete your trigger

squeeze while the sights are on the target.

About ninety per cent of this can be accomplished without firing a shot, or going out of your house. The procedure is this. First pin a target with a half inch bull on the wall. Take your rifle with your weight balanced

the collar bone and the rifle has a fair recoil, you'll get a sharp reminder that you are doing something wrong.

Now relax and let the gun wobble. The only men who could hold a rifle still are between the pages of a book. Time and practice will slow the bar-

*Probably eighty to ninety percent of all deer shooting is done in the offhand position.*



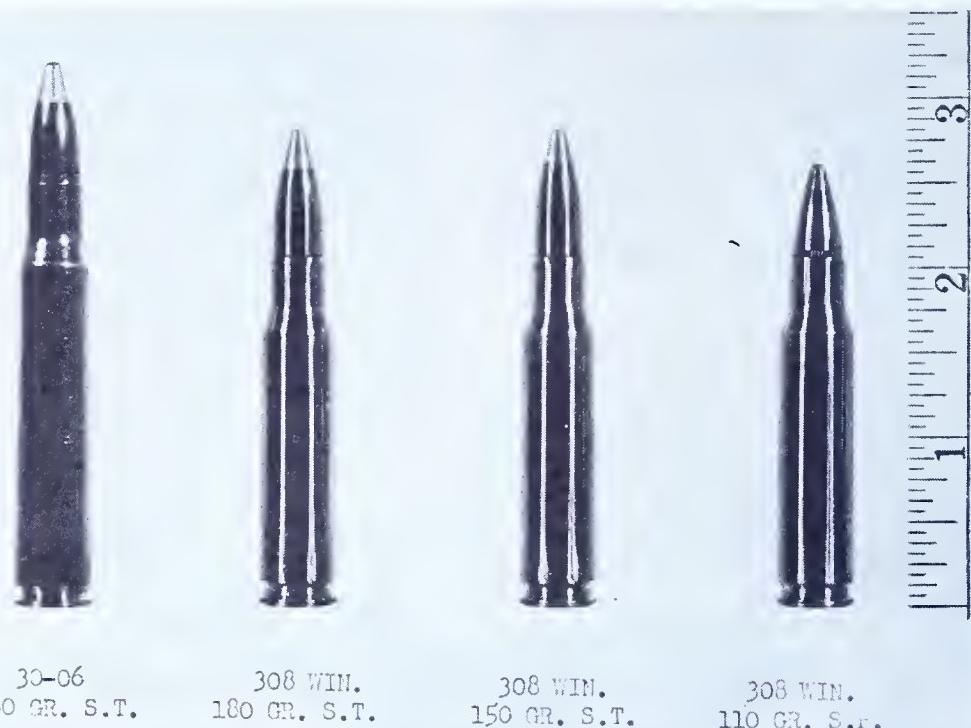
Ned Smith

on both feet. Which way your feet point is of no concern here, but good balance is. If a deer catches you off balance it's beans for supper no matter which way your feet point. Now place the left arm directly under the rifle (if you are right handed) and let it rest in the palm of the hand close to the heel and just ahead of the trigger guard. Thus you have the barrel weight ahead of the balance point where it will do the most good in slowing down movement. The right hand should hold the grip with arm about shoulder high, the butt pressing firmly in the hollow formed between the shoulder and the upper arm. If you let it slip down on

rel down and narrow its travel; the rest is up to the trigger finger.

Now we come to getting the shot away. Place the trigger finger well inside the trigger guard with the trigger resting between the first and second joints. Now point the gun at the target and as the sights swing on the bull keep pressing the trigger. When they swing off hold it. Keep this up until the hammer falls.

Now comes the important part. WATCH where your sights are in relation to the bullseye WHEN the hammer falls. This calling the shot tells you whether you yanked the trigger and any other faults that may plague you.



If you put in ten minutes a day dry practice you will notice the movement slowing down and the trigger squeeze more nearly matching it. In 30 days a decided improvement will be noted and then a few check shots should be fired. In this practice I strongly advise you to use the gun you hunt with. In this way you will acquire the feel of the rifle which is a big factor when you have to make a fast shot.

Fire a minimum number of shots per year using this method—just enough to get acquainted with your rifle and its recoil. It's not just according to the manual and you may not become a champion by using it. On the other hand its the most painless method I know of to attain a modicum of offhand skill at a reasonable distance. Furthermore if you can remember never to take an offhand shot if you have time park your carcass on the ground, you'll be eatin' venison with a degree of regularity that will astonish your leather-stocking friends.

*Comparison of the 30-06 cartridge with the new 308 Winchester short sporting cartridges.*

## WINCHESTER BRINGS OUT A 308

At last it has happened! A light, short, fine-pointing bolt action rifle that handles lightning fast in the brush and has enough accuracy for the occasional long shot that keeps popping up. Ever since the model 1920 Savage disappeared bolt action minded hunters bemoaned the fact that if you wanted a bolt gun that handled and pointed like a brush gun should you had to go to a custom gun builder.

Now wrapped up in the same package you not only have the one but due to its accuracy and good fitting stock can be held steady enough to reach out and whack a whitetail where he lives at 300 to 350 yards with scope sights.

The cartridge is none other than the T-65 caliber .30 which has been developed by our Ordnance Corps in

an effort to reduce both weight and recoil while retaining practically the same ballistics of our present .30-06 military cartridge.

The new .308 Winchester sporting cartridge is one half inch shorter and ten per cent lighter than the standard .30-06 cartridge. By the use of the ball type powder developed by the Olin Process and used during the last war, recoil and muzzle blast are materially reduced while good ballistics are maintained.

good news to the boys who like to use their big game rifles on varmints.

The stock has been redesigned and some weight reduction accomplished. It is not a spindly piece of wood that gives you a man-sized jolt every time you pull the trigger, as so often seen on light weight rifles.

It can be had in either the high or low comb without extra charge. The pistol grip is well located and feels good to the hand. The checkering on the grip and fore-arm is the same as



Ballistics of the new cartridge follow closely the figures of the .30-06. It is loaded in three bullet weights as follows:

110 grain velocity muzzle 3340 ft.

Energy Muzzle 2730 lbs.

Trajectory 200 yards 2.2

150 grain velocity muzzle 2860 ft.

Energy Muzzle 2730 lbs.

Trajectory 200 yards 2.6

180 grain velocity muzzle 2610 ft.

Energy Muzzle 2720 lbs.

Trajectory 200 yards 3.1

You can see from these figures that the hunter could not tell the difference between the .308 and the .30-06 in the field and its performance on game should be about the same.

The action is the model 70. Weight reduction has been obtained by use of an aluminum butt plate, trigger guard and magazine floor plate. The big change is the barrel which is 22 inches long with a new contour and a 12 inch twist. This is the first departure from the standard 10 inch twist and should give good accuracy with the 110 grain bullet, which the faster twist did not. This will be

on the model 70.

Another new Winchester departure in the right direction is the employment of a full floating barrel. My own rifles which have free floating barrels maintain their zero winter and summer and do away with the grief a tightly bedded barrel can hand you at times.

Another big item in a woods gun that is often overlooked is ease by which the rifle can be carried. There is no streamlined trigger guard to slip out of the crook of your arm resulting in a wild grab to keep the muzzle from being filled with dirt or snow. I often wonder how many miles these streamline designers ever toted a rifle in the woods. The rifle stays put and its weight of  $6\frac{1}{2}$  pounds makes it a dream at the end of a hard day in rough country.

Due to limited production schedules there will be few of this model on the dealers shelves this year. But the lads who are lucky will get a fine rifle and one that will be around for a long time to come.

. . . The End.



## ARROW POINTS

THE sport of Archery is relatively safe altho the bow is rightfully classed as a lethal weapon and was the means by which man gained physical superiority over the animal kingdom.

Archers were the counterpart of the modern infantry in ancient armies. Wars of conquest were decided in battles in which the archers played the decisive role. As late as 1415 Henry V of England defeated a greatly superior force of French knights and men-at-arms with an army consisting of about one thousand men-at-arms and six thousand archers. The French lost five thousand of their nobility killed in the field of battle. The English losses were thirteen men-at-arms and about one hundred foot soldiers. In the hand of an experienced archer the bow proved a deadly and decisive weapon until the advent of firearms.

The modern bow is a superior weapon when compared to its ancient counterpart. Knowledge of the strength of materials and modern manufacturing techniques have produced a bow which is outstanding in performance in the hands of an experienced archer.

In the field the archer's code of conduct is predicated on the necessity to safeguard himself and his fellow archers from avoidable and regrettable accidents. Safety and courtesy can be considered synonymous terms in archery. To practice one is to assure the other.

Archery is a competitive sport in which group participation, even in the hunting field, is the rule rather than the exception and certain basic rules of conduct are general in appli-

# A Safety Code

By Thomas A. Forbes

cation. Their sole aim is to prevent accidental injury to participants in the sport or to spectators. The match rifleman would immediately recognize the similarity between the conduct on the shooting line at a competitive rifle match and at an archery shoot or tournament. The rules which apply to safe gun handling on the shooting line or in the hunting field are generally applicable to the archer armed with a bow.

In order to prevent accidents among the recent converts to the bow the cardinal rules for safe bow handling and conduct on the range are herein set forth. Use them as a guide to protect yourself and your fellow archers from injury.

### Self Inflicted Injuries and How To Avoid Them

1. Relax the bow arm at full draw with the elbow joint turned down and out to avoid striking the elbow with the bow string.

2. Train the shoulder of the bow arm to stay down and back to avoid striking it with the bow string. A light bow is preferable in learning the proper technique. The tendency to hunch the shoulder of the bow arm is increased as the drawing weight of the bow increases.

3. The use of an arm guard is necessary to prevent injury to the bow forearm above the wrist. Proper shooting form will result in the bow string striking the forearm. If you are twisting your wrist to prevent the string striking the forearm just above the wrist you are holding the bow improperly and your marksmanship will suffer.

4. Wear a finger guard to protect the three fingers of the shooting hand

used to draw the bow string. Before the tips of the fingers become tender and sore apply tincture of benzoin which will toughen the skin. Beginners should be particularly careful to proceed slowly and stop shooting for the day when the fingers become tender.

5. Put an arrow rest on the bow if it does not come equipped with one. Stiff feathers can cut the index finger of the bow hand at the second joint as they ride across the hand.

6. The forefinger of the bow hand should be curled lightly around the bow to avoid striking it with the arrow.

7. In bracing the bow keep the fingers on top of the bow string to avoid pinching between the string and the bow.

8. Make certain the string is properly nocked before you release pressure. Should the loop slip out of the hock as pressure is released the limb of the bow will fly back and may strike the archer in the face.

9. After the bow is braced flex it gradually to the required arrow length and no farther. Bringing a bow to full draw immediately after it is braced may cause it to break. Overdrawing will damage the bow fibres. It may break immediately or on a subsequent draw.

10. Inspect your bow frequently for bruises and checks or cracks. If you find the fibres of the bow material damaged or a separation of materials in the case of laminated bows, retire the bow as it is a potential danger to the user.

11. Check the fistmele frequently while you are shooting. It is indicative of the condition of either the bow or the bow string. One or the other is letting down—in other words the bow or string has weakened—if the fistmele increases while you are shooting. If your arrows suddenly begin to fall low on the target check your bow string and bow immediately for signs of failure.

12. If your bow comes supplied with a "keeper," which is a string attached to the top of the bow and through the loop of the bow string, remove it. When a bow with a keeper breaks it generally forces the top limb to fly back and strike the archer on the head or face.

13. Renew a bow string immediately it shows the slightest sign of wear. Frequently when a string breaks the bow will also break.

14. As an additional precaution it is prudent to wear head gear that offers some protection in case the archer is struck by a broken bow limb. A stiff-visored cap is a wise safety precaution. Do not buy one with the visor so long that it will interfere with the bow string when the bow is brought to full draw.

15. Arrows should be selected with regard to the weight of the bow and the drawing length of the individual archer.

16. An arrow with insufficient spine for the drawing weight of the bow may and can buckle and break as it travels around the bow at the beginning of its flight. The broken shaft may puncture the bow hand of the archer and cause a painful injury. A like injury may be sustained if the arrow is overdrawn just prior to the instant of release. The tip may be forced against the belly of the bow causing the shaft to break.

17. Examine wooden shafted arrows frequently and discard (break in two) those that show any evidence of cracks, checks, bruises, or splintering. These indicate points of weakness and an arrow undergoes its greatest stress as it begins its flight and bends around the bow.

18. Do not shoot arrows when portions of the feathers become separated from the shaft. A loose feather can be driven into the bow hand.

19. If an arrow slips from the arrow rest during the draw or from the shooting hand if no arrow rest has been built into the bow, do not

try to replace the arrow while at full draw. You may unintentionally release the arrow and drive it into your bow hand. Take the bow down and repeat the draw from the beginning.

### Group Shooting

20. A safe gun handler never lets the muzzle of his weapon point toward an individual and an arrow nocked in the bow must be handled in the same manner. The string may slip from the drawing fingers at the beginning of the draw.

21. Establish a common shooting line and have supervised practise and shooting at all times.

22. If different distances are to be shot at the same time set the targets at the distances required from one common shooting line.

23. Begin shooting on a given signal and only when all archers are behind the shooting line. Stop shooting at a given signal.

24. Never nock an arrow until the signal is given to shoot. A nocked arrow, like a loaded gun, is dangerous.

25. There is no safe place in front of the shooting line. Stay behind the

line until the last arrow has been shot and the signal given to go to the target to retrieve arrows.

26. Avoid shooting when people are passing behind the targets even at a distance. An arrow may strike the ground, ricochet and travel a considerable distance before it again comes to rest; or, as has happened to many an experienced archer, he may move forward from the fifty to the forty yard range and by error set his sight for sixty yards. No one is more surprised than the archer himself when he sees his arrow fly high over the target.

27. If you shoot on an indoor range the entrance should be back of the shooting line and other doors at the sides or rear of the shooting line should be barred against entrance from the outside. If panic locks are not installed and fire regulations prohibit locking the doors, notice should be posted at each of these entrances that the archery range is in use and to enter is dangerous.

Bear in mind that eternal vigilance is the best guarantee of safety both to yourself and to others.

. . . *The End*

## NEW WATERFOWL HARVEST SURVEY METHOD TRIED

Duck, goose, and coot hunters will have an opportunity to participate in a nation-wide survey of the migratory waterfowl harvest this season, the Wildlife Management Institute reports.

Approximately 150 selected post offices have been furnished with card forms to be given to purchasers of federal duck stamps. Hunters who receive and use these forms will be asked later to complete the questionnaire. It is requested that one half of the card form be filled out and mailed postage free to the U. S. Fish and Wildlife Service at the time of stamp purchase. The other half is retained by the hunter as a score card for listing the numbers and kinds of waterfowl bagged. The items recorded on the card should be transferred to a final questionnaire which the hunter will receive at the close of the season.

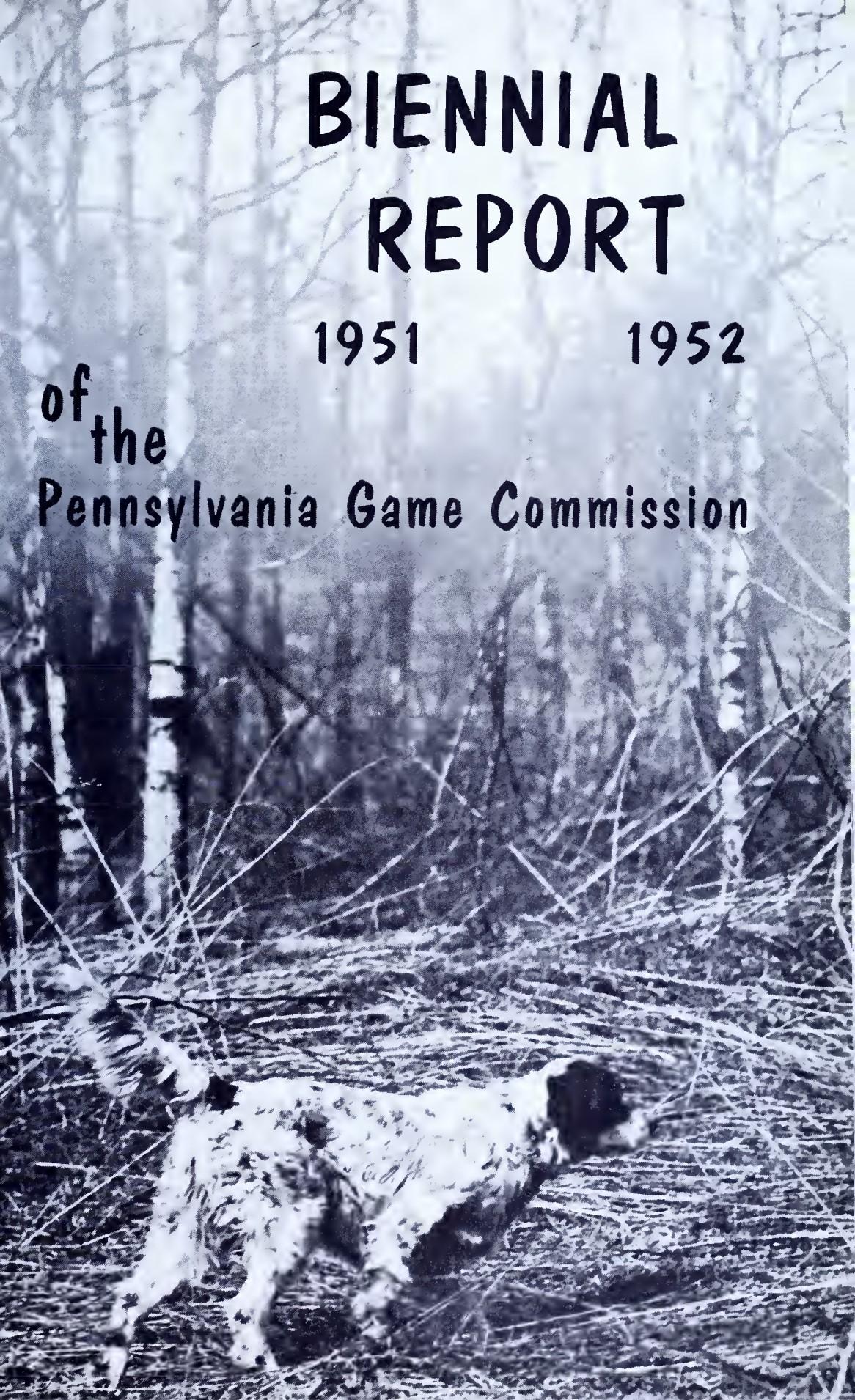
Information which each hunter can furnish about his personal harvest of waterfowl is extremely important to the success of this method since it will provide the Fish and Wildlife Service with a basis for analysis of the relationship between hunter kills and bird season regulations. This system has been successfully used by some state conservation departments, but has never been used on a nation-wide basis. Results should show an improvement over past methods tried. This will depend upon the waterfowl hunter, who is an integral part of this survey. His cooperation will be an important contribution to the perpetuation of the sport of wildfowling.

# BIENNIAL REPORT

1951

1952

of the  
Pennsylvania Game Commission



## *IN MEMORIAM*

### **ROBERT LAMBERTON**

Honorable Robert Lamberton, member of the Game Commission from Franklin, died on July 20, 1952 following a long illness. In his passing conservation lost one of its most ardent supporters and the Commission and the sportsmen a great friend. Mr. Lamberton was appointed to the Commission March 26, 1935, served as Vice-President from January 8, 1942 to January 8, 1952, and as President from January 9, 1952 until his death.

### **NORMAN M. WOOD**

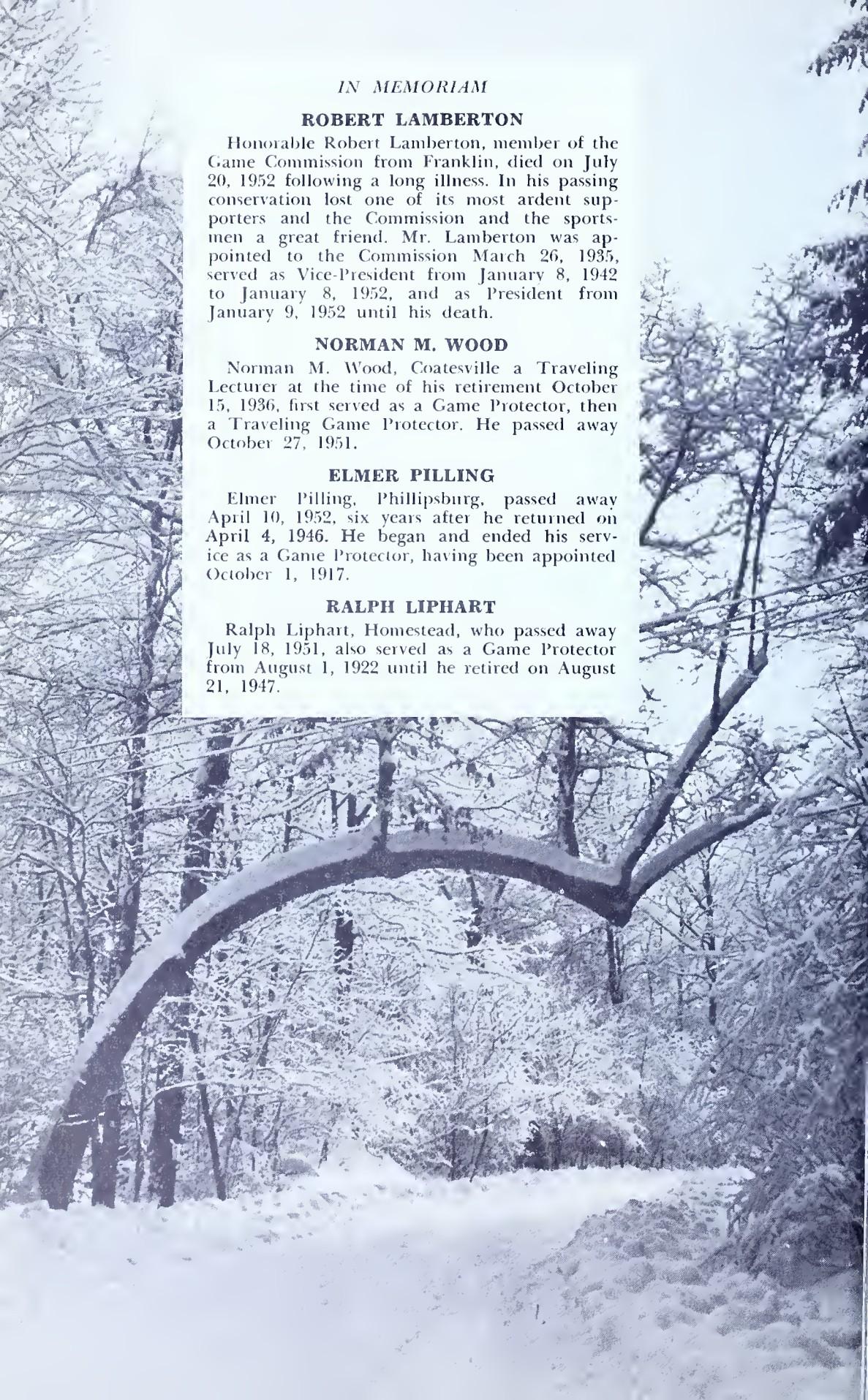
Norman M. Wood, Coatesville a Traveling Lecturer at the time of his retirement October 15, 1936, first served as a Game Protector, then a Traveling Game Protector. He passed away October 27, 1951.

### **ELMER PILLING**

Elmer Pilling, Phillipsburg, passed away April 10, 1952, six years after he returned on April 4, 1946. He began and ended his service as a Game Protector, having been appointed October 1, 1917.

### **RALPH LIPHART**

Ralph Liphart, Homestead, who passed away July 18, 1951, also served as a Game Protector from August 1, 1922 until he retired on August 21, 1947.



## Letter of Transmittal

Harrisburg, Pa.  
June 1, 1952

To His Excellency JOHN S. FINE  
GOVERNOR OF PENNSYLVANIA  
HARRISBURG, PENNSYLVANIA

Sir:

The work and accomplishments of the Pennsylvania Game Commission for the biennium ending May 31, 1952, are hereinafter set forth.

Every phase of the wildlife conservation program was expanded and more than \$8,000,000 in license fees and other revenues were spent to protect and preserve our furred and feathered friends and to educate our citizens, especially our youth, concerning their economic and recreational values.

To you and the General Assembly, to the sportsmen and farmers, to the educators and wildlife lovers, and to the outdoor writers we express our grateful appreciation for the help and encouragement we received in our endeavors. Because of them we progressed further and accomplished more than we ever did before.

Respectfully submitted,

R. LAMBERTON, President  
JOHN C. HERMAN, Vice-President  
ROSS L. LEFFLER  
NICHOLAS BIDDLE  
G. I. PHILLIPS  
HAROLD MOLTZ  
JOSEPH WILLSON  
B. K. WILLIAMS

Attest:

THOS. D. FRYE  
*Executive Director*



*Ross L. Leffler*



*Robert Lamberton*

## Highlights

On January 10, 1952, the Honorable Ross Leffler, a member of the Game Commission since June 24, 1927, relinquished the Presidency of this body because his position as Assistant to the Executive Vice-President of Operations of the United States Steel Company and as Civil Defense Director of the Allegheny County District, coupled with his many other official responsibilities, prevented continuance of his valuable services in that capacity. His membership with the Commission did not terminate with his resignation as President, and we hope it will remain unbroken for many years to come.

Catastrophic as it developed, his able successor, the Honorable Robert Lamberton of Franklin, passed away July 20, 1952, following a long illness. Mr. Lamberton served on the Commission since March 1935 and was greatly admired by everyone for his high principles and fine sportsmanship. As a tribute to his conservation endeavors a memorial plaque was erected and dedicated in his honor at the Pymatuning Waterfowl Sanctuary, Linesville, Pennsylvania on August 20, 1950.

### ADMINISTRATION

The reorganization which was effected during the previous biennium proved so successful that no changes were necessary to more efficiently streamline the Commission's operating machinery.

### REVENUE

The largest amount of money ever received or expended for wildlife conservation in Pennsylvania was administered during this biennium. Receipts totaled \$7,943,986.22 and expenditures amounted to \$8,277,399.82, the latter including a portion of the cash balance carried over from the previous biennium.

This is the first biennial period during which operations were based on the increased license fees which became effective September 1, 1949 when the \$2.00 resident hunter's license was increased to \$3.15 and the \$15.00 non-resident license was raised to \$20.00. The previous biennium included one year's operation at the old rates and one at the higher fees.

### HUNTING ACCIDENTS

Hunting accidents in the aggregate were fewer although there were too many fatalities, 16 occurring in 1950 and 25 in 1951. Do not overlook the nine years summary on page 82. It shows an interesting relationship between the number of licensed hunters and the number of accidents. Apparently we must expect a certain percentage of mishaps notwithstanding the intensive campaigns which are constantly being waged to make hunters safety conscious.

### ANTLERLESS DEER SEASONS

Although two-day antlerless deer seasons were declared in 1950 and 1951 during which 69,467 animals were killed, the whitetail is still a serious problem in many parts of the Commonwealth. It will be solved only when the herd is reduced commensurately with existing food conditions. When that happy medium is reached there probably will be fewer deer, but there will be bigger and better trophies waiting to pit their wits against the hunter's skill and ingenuity.

For those who are interested in the deer problem the Commission suggests that they read the Special GAME NEWS Issue, No. 1, September 1951, which can be obtained for 10c per copy.

Photo by Ralph Cady.

*Many deer starve to death each winter because they are too numerous for their existing food supply.*



## GAME LANDS

The acquisition of nearly 20,000 additional acres of good hunting territory increased the aggregate area of Game Lands to over 900,000 acres. These wilderness areas are insurance policies against private monopoly and commercial exploitation. Their acquisition since 1920 has been the best investment the sportsmen ever made. The dividends they produce in recreation for hunters and nature lovers can never be measured in dollars and cents. Visit your Game Lands and enjoy nature at its best. There are now 197 units located in 63 counties. A county map showing the location of Game Lands and other interesting features appears in the Pennsylvania GAME NEWS monthly.

## GAME MANAGEMENT

Much was done to improve wildlife habitat on farms affiliated with this program. Thousands of acres were surveyed for contouring, and millions of seedlings were distributed and in many instances planted by Commission personnel at no cost to the landowner.

Cooperating farmers were given technical assistance on farm-pond construction, drainage problems, pasture improvement, woodland management and other modern agricultural practices to improve crop and wildlife yields and to conserve soil and water.



Photo by Ralph Cady.

*Landowners are given technical assistance on farm pond construction.*



Photo by D. L. Batcheler.  
*Servicea lespedeza is used as a cover and food crop for small game.*

### FOOD & COVER

Modern agricultural practices also were applied on many acres of Game Lands and food strips were purchased on private lands to provide supplemental wildlife cafeterias on farms open to public hunting. In the forest areas many acres were cleared and planted to strips of corn and small grain so that deer, wild turkeys, grouse, squirrels and other woodland creatures would have well filled larders when natural foods were scarce.

Over three million tree, shrub and vine seedlings were planted to improve food and cover for wildlife. Eleven small nurseries, located on the Game Lands, provided some of this material but the bulk was purchased from other state agencies and commercial nurseries in order to meet the requirements of the expanded food and cover program.

The foregoing describes only an infinitesimal part of this enormous program. Be sure to read the general text beginning on page 103 for the whole story.

### TIMBER SALES

Forests must be properly managed to guarantee a succession of the most desirable trees, to harvest those which have reached maturity and to eliminate the undesirable species. This process is an economic one that pays double dividends. Wildlife benefits from selective cutting and improved food and cover conditions, and the Game Fund is enriched by timber sales. During the past biennium the sale of forest products on over 8,000 acres of Game Lands provided a cash return of \$91,748.14.

## ALLEGHENY NATIONAL FOREST

Cooperative programs usually are healthy and beneficial programs.

One such project, jointly approved on February 1, 1950, permits the Commission to manage wildlife on the Allegheny National Forest by planting food strips, constructing ponds, improving woodland borders, releasing and pruning fruit trees, etc. Already much work has been done and more is currently being undertaken. This is the kind of cooperative long range planning that pays big dividends.

## FARM-GAME PROGRAM

Since its inception in 1936 the cooperative farm-game program has unquestionably been one of the most popular public relations undertakings of the Commission. It has not only opened over a million acres of land heretofore close to public shooting, but it has created mutual respect and admiration on the part of the Commission, the farmers and the sportsmen. During the two years just passed, 692 farms containing 94,896 acres were added to this ever-growing program which now numbers 173 projects in 48 counties of the Commonwealth.

## WILDLIFE PROTECTION

There were 2,055 fewer prosecutions for violations of the Game Law during this biennium than there were during the previous two year period—8,877 compared with 10,932. The decrease is believed due to the educational efforts among all and especially the new generation of hunters. The law-breaker and the vandal will likely always be with us, but the new philosophy of sportsmanship which is being inculcated in tomorrow's youngsters by the Commission, the outdoor writers and the up-and-going sportsmen's organizations will, in the years to come, be reflected in a reduced number of violations and a greater respect for the need of sound laws and their observance.

By all means note the ten year summary of prosecutions which appears on page 108, and the hunting license revocations which immediately follow. The fact that 2,767 persons had their hunting privileges suspended for violations of a major character should make potential cheaters realize that dishonesty begets only penalties and dishonor.

## RABIES EPIDEMIC

The Commission planned and put into effect a program to control one of the biggest outbreaks of rabies in the history of the Commonwealth. Responding to an SOS from the State Departments of Health and Agriculture, every available Game Protector, and every able bodied employe from the Harrisburg office who could be spared, was assigned to work the affected areas.

The endeavor cost approximately a hundred and fifty thousand dollars but this was not counted while a single human life was at stake. For a complete report on this outstanding predator and rabies control campaign see page 111. All who played a part in it are to be highly commended for their efforts. The Bucks County Court exonerated the Executive Director and Game Protector who were arrested for spreading the poison. The court ruled that the Commonwealth could operate such a program in behalf of public health and safety, therefore agents of the State were not responsible when performing their prescribed duties.

## FURBEARERS

A low market on long haired furbearers lessened the initiative of trappers consequently there was a tremendous increase in the number of raccoons,



Photo by Ralph Cady.

A serious rabies outbreak called for collective planning by several State agencies and the Federal Government. In the group above are left to right: John C. Herman, Vice and Acting President of the Game Commission, Howard J. Martley, U. S. Fish & Wildlife Service, H. L. Brunner, Dept. of Agriculture, Everett M. Mercer and Howard A. Marrill, U. S. Fish & Wildlife Service, Wm. D. Schrack, Jr., Dept. of Health, Clifford C. Presnall, U. S. Fish & Wildlife Service, and Thos. D. Frye, Executive Director, Game Commission.

skunks and opossums. Muskrats on the other hand became alarmingly scarce and the season was closed during 1950. Nonetheless Pennsylvania trappers reaped a harvest of 838,772 furbearers for which they were paid \$1,353,354.94.

### BOUNTIES

The bounty on the red fox, removed in 1949, was reestablished in June 1951 because of the increase in population and because the fur value of the animals was not sufficient inducement for trappers to harvest them. However, 26,462 were taken during the last half of the biennium which helped somewhat in keeping the animals in check.

Other predators for which a reward was paid included 20,747 weasels, 39,060 gray foxes, 3,191 great horned owls and 32 goshawks. The bounty paid for all of these predators amounted to \$298,742.50.

The bounty on the goshawk, which had been effective since 1949, was removed May 31, 1951. Too few of the birds occur within the Commonwealth to warrant a control program which would result in the killing of many beneficial hawks through improper identification.

## PROPAGATION

State Game Farm operations set a new record. The achievements are, for the most part, reported statistically and can be appreciated only by reference to the text. However, we should be remiss if we did not emphasize here the Day-old Pheasant Chick Program under which more than 390,000 of these youngsters were shipped from the Game Farms to interested sportsmen and farmer-cooperators whose lands are open to public hunting. From all sources a total of 542,216 pheasants were released—the highest number ever liberated by the Commission.

## TRAINING

The Sixth Class of 20 Student Game Protectors which started its course of instruction on May 1, 1950, completed one year of intensive training on April 28, 1951. The Seventh Class of 17 Student Officers began its schooling on May 25, 1952. All of these men were selected on a competitive basis.

In addition a number of beneficial in-service conferences were held for salaried field officers, research workers, deputy game protectors and foremen of food and cover activities.

## PUBLIC RELATIONS

A well informed and interested people are an understanding and cooperative people. Realizing this the Commission expanded its output of information on wildlife projects, programs and developments. This service paid tremendous dividends to the increased number of outdoor writers who use our news to improve the material in their columns. Commission personnel frequently visited these correspondents so they would have a better grasp of the all over wildlife conservation picture, and these contacts established very friendly relations and resulted in a greatly improved job of outdoor reporting.

## CONSERVATION EDUCATION

One of the most forward steps in the conservation education program was the establishment of a statewide program among the Future Farmers of America to improve conditions for wildlife on their lands. It was jointly sponsored by the Department of Public Instruction and the Game Commission on a competitive basis, the winners to receive cash awards from a \$1,000 subsidy allocated from the Game Fund. Other cooperative groups which the Commission helped support financially included the Teacher's Laboratory, State College—\$1,000; The Academy of Natural Sciences, Philadelphia—\$2,000; The Carnegie Museum, Pittsburgh—\$1,000; and the Forensic League of the University of Pittsburgh, Pittsburgh—\$500.

The format of the Pennsylvania GAME NEWS was considerably improved and while the number of pages was doubled, the size of the magazine was reduced. The changes resulted in much greater circulation.

Several new motion pictures, new color charts of birds and mammals and other educational literature were prepared and distributed and thousands of visual aid programs were presented in the schools, before sportsmen's clubs and at other gatherings, details of which can be found on page 91.

## RESEARCH

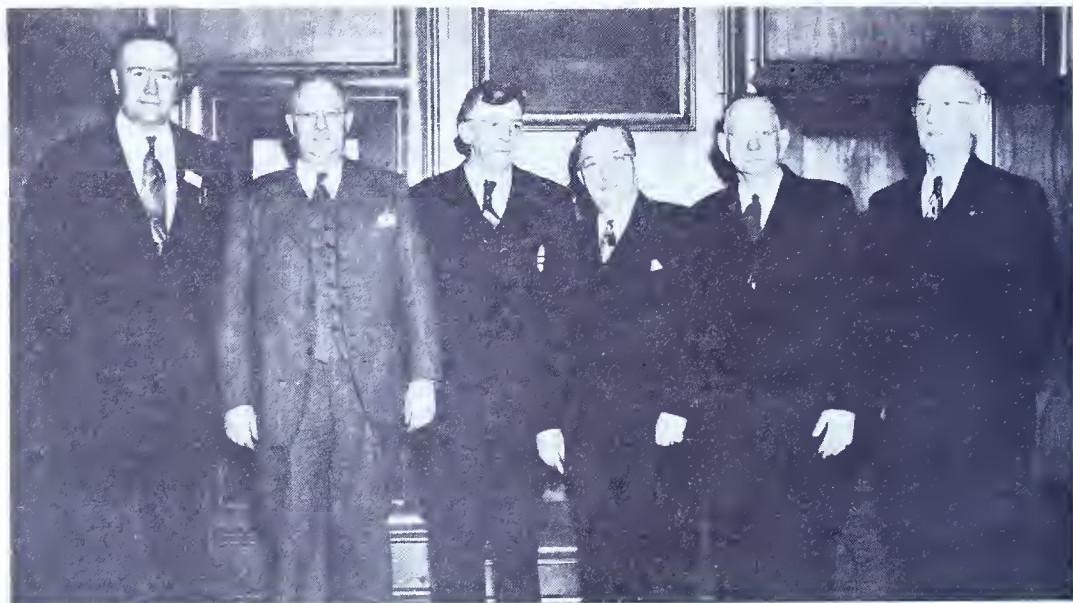
Several major studies were completed including one on the mammals of the Commonwealth, the management of the cottontail rabbit, environmental control on forest lands for game management, predators and predator control methods, and a survey of migratory waterfowl.

Other studies currently in operation include one on the white-tailed deer,



Photo by Ralph Cady.

*Thos. D. Frye, Executive Director of the Commission, smilingly presents diplomas to members of the sixth student officer graduating class.*



*Photo by Leo Luttringer.*

The Commission and the Federation of Sportsmen's Clubs have enjoyed wholesome relations through the years. During the period of this report the above officers administered the program of the Federation. Left to right: Ray Armstrong, currently 1st Vice President, Dale Furst, former President, Joe Barkley, Current President, Dr. C. A. Mortimer (deceased) former Secretary-Treasurer, Merrill Merrits, former President, Robert Cooper, former President, Other current officers include Steve Emmanuel, 2nd Vice-President, Charles Nehf, Secretary and Glenn C. Dodds, Treasurer.

the wild turkey, woodcock, degree of survival of rabbits liberated under the live trapping program, the need for safety colors for hunting clothing, and miscellaneous projects designed to improve wildlife and hunting conditions.

#### SPORTSMEN'S COOPERATION

The Commission invited sportsmen's and other groups to meet and discuss mutual problems, especially the hunting seasons and bag limits, and two such conferences were held during the biennium. The Executive Director and members of the staff were present at the annual meetings of the Federation of Sportsmen's Clubs, in addition to a member of the Commission.

#### CONFERENCES ATTENDED

Certain members of the Commission, the Executive Director, and the Administrative Staff attended and frequently participated in quite a few important national conferences as follows:

Two meetings of the International Association of Fish, Game and Conservation Commissioners were attended—one in Memphis, Tennessee, September 14 and 15, 1950 and the other in Rochester, New York on September 10 and 11, 1951.

Three North American Wildlife Conferences—one at San Francisco in March 1950; one at Milwaukee, March 5-7, 1951; and one at Miami, March 17-19, 1952.

Two Northeast Regional Conferences—at Wilmington, Delaware, in March 1950; and at Jackson's Mills, West Virginia, April 1-4, 1952.

The Outdoor Writer's of America Association's conferences at Moosehead Lake, Maine, June 10-16, 1950 and Escanaba, Michigan, July 1951 also were attended.

Two annual meetings of the Conservation Law Enforcement Chief's Association, one at Annapolis, Maryland in 1951, the other at Orleans, Cape Cod, Massachusetts in 1952.

Special meetings included the Atlantic Waterfowl Council, Washington, D. C., on January 28 and 29, 1952 and two important conferences on the serious rabies problem existing in the eastern states. One of these meetings, known as the Interstate Meeting on Rabies Control, was held at the Roosevelt Hotel, New York on January 25, 1952. The other, held at Washington, D. C. on June 2 and 3, 1952, resulted in the formation of the Eastern Rabies Control Council.

### LEGISLATION

New laws and amendments to existing laws were enacted as follows:

Section 714. An individual is now permitted to transport a cut up, unmarked portion of big game if such individual can furnish the name and address of the person who killed the animal and any other information required to properly establish its legal possession.

Section 806. Uncased and unwrapped guns and loose ammunition may now be carried in vehicles at any time, provided the guns are unloaded.

Section 411. Extends the seasons for certain classes of Regulated Shooting Grounds. In areas where pheasants and quail do not thrive and normally produce a shootable supply of these birds, or on those grounds which are commercially operated and are open to public use, the season for ringneck pheasants, bobwhite quail, chukar partridges, and mallard or black ducks more than two generations removed from the wild shall be fixed by the Commission without regard to the general state-wide open season for small game, thus leaving the seasons entirely at the discretion of the Commission.

On all other Regulated Shooting Grounds the season for such domestically produced ringneck pheasants, bobwhite quail, chukar partridges and mallard or black ducks more than two generations removed from the wild, shall begin on the opening day of the season for such game birds as fixed by law or by Commission regulations, and continue through the last day of February.

Mallard or black ducks less than two generations removed from the wild may be taken on all Regulated Shooting Grounds only in accordance with the season established for waterfowl hunting by Federal regulations in effect for the Commonwealth of Pennsylvania.

Section 721. Provides that the period of Retriever Trials shall be from the first day of October to the 31st day of March, in lieu of the present provision of the Game Law, which is from October 15 to December 31.

Section 501. A subsection (e) was added to this section which provides that in each year in which there is an open season for hunting deer there shall in addition be an open season for hunting deer with bows and arrows exclusively, unless otherwise declared by resolution of the Commission. The Commission is authorized to fix the duration of the season and sex of deer to be killed. A special license obtainable at the Pennsylvania Department of Revenue, Harrisburg, Pa., for \$2.00 is required in addition to the regular resident or non-resident hunting license.

Section 501. Subsection (b) was amended to direct the Commission to remove all protection on raccoons or declare an open season on such animals or direct the killing and disposition of them in such manner as the case may require in counties infested by rabies if investigation or information obtained by the Department of Agriculture should warrant such drastic action.

Section 808.1. A new law which prohibits hunting or shooting within burial grounds under penalty of \$10.00 for each offense.



Photo by A. L. Lewis Studio, Reynoldsville, Pa.

*Anna (Mrs. William E.) Johnson, of Summerville, was the first person to report the killing of a deer with a bow and arrow during the new special archery season. It weighed 135 lbs. hog-dressed and had six points.*

Section 704. Permits the use of semi-automatic shotguns for the hunting and killing of small game, predators and unprotected birds.

Section 701. Authorizes the possession of game lawfully killed during the open season up to and including July 1st of the year immediately following; eliminates \$1.00 permits for possession after sixty days; and allows possession of live raccoons when taken in season without previously required permit.

Act No. 249. Eliminates the right of licensees and certain residents of the respective counties to abrogate an antlerless deer season declared by the Commission. It requires the Commission to decide the number of antlerless deer hunting licenses to be issued in each county at \$1.10 each. (Later amended to \$1.15) Such licenses may be issued to holders of nonresident and resident hunting licenses; provided, however, that no licenses shall be issued to nonresidents except during a period of 30 days immediately preceding the opening date of the season. Sixty per cent of the licenses will be issued by the County Treasurer of the County in which such licenses are to be used, while the remaining forty percent will be issued by Department of Revenue. (See amendment by Act No. 566)

Act No. 566. Amends Act No. 249 cited in the preceding item, by increasing the license fee from \$1.10 to \$1.15 and by providing that such licenses and tags shall be issued solely by the County Treasurer in counties where such deer may be hunted and killed.

Section 719. Advances the opening of the dog training period from August 20 to August 1.

Act No. 324. Amends Section 401 of, and adds Section 418.1 to the Game Law. The new act authorizes the Game Commission to issue free special permits to disabled veterans having hunting licenses, who served in the active military or naval forces of the U. S., and who are suffering from paraplegia and have permanent paralysis of both legs and lower parts of the body, or who are suffering from hemiplegia and have permanent paralysis of one leg and one arm or either side of the body, resulting from traumatic injury to the spinal cord or brain, or who have suffered amputation of both feet or one hand and one foot, sustained through enemy action or accident while in such active military or naval service, permitting them to hunt under Commission regulations from automobiles.

# BUREAU OF ADMINISTRATION

## Accounting and Service

### HUNTING LICENSES

Pennsylvania's wildlife conservation program is supported mainly by sportsmen through their hunting license fees. Additional revenue is received from penalties, special permits, timber sales and Federal Aid.

License sales fluctuate from year to year and programs must be restricted to funds available. While the record of 854,840 resident licenses sold in 1948 still stands, the sale of 30,014 nonresident licenses in 1951 tops the previous record of 28,085 licenses sold in 1948.

The State Department of Revenue handles all matters relating to the issuance of hunting licenses, including the settlement of accounts with agents and the transmission of monies accruing from this source to the Treasury Department for deposit in the Game Fund. The number of licenses issued during the past 5 years is given below.

Year	Resident		Nonresident		Total
	Fee	Number	Fee	Number	
1947 .....	\$2.00	822,423*	\$15.00	28,012	850,435
1948 .....	\$2.00	854,840*	\$15.00	28,085	882,923
1949 .....	\$3.15	815,915*	\$20.00	24,032	839,947
1950 .....	\$3.15	808,171*	\$20.00	26,001	834,172
1951 .....	\$3.15	826,044*	\$20.00	31,278	857,322

\*Includes free licenses issued to members of the Armed Forces and Disabled Veterans, as follows:

Year	Members of The	Disabled	Total
	Armed Forces	Veterans	
1947 .....	2,846	.....	2,846
1948 .....	3,770	.....	3,770
1949 .....	5,581	275**	5,856
1950 .....	5,598	325**	6,223
1951 .....	15,317	378**	15,695

\*\*Authorized by the 1949 General Assembly.

### SPECIAL ARCHERY SEASON

Exercising for the first time provisions of a new law providing for a special archery season and special archery licenses, the Commission declared such a season for male deer with two or more points to one antler from October 15 to October 27 inclusive in 1951. The number of modern Robin Hoods who responded to this invitation was surprising; 5,542 obtained licenses and 33 of them killed deer. The sport is expected to increase in popularity as time goes on. In order to help the novice learn how properly to handle archery equipment the Commission is producing a motion picture on "How to Shoot the Bow."

### HUNTING ACCIDENTS

Every known educational and publicity medium was used to make hunters safety conscious. Nonetheless some mishaps did occur. There will always be



Photo by D. L. Batcheler.

*Teach the youth how to handle firearms properly today and you will have fewer accidents tomorrow.*

gunning accidents just as there will always be automobile accidents. But if the Commission did not constantly carry on intensified safety programs the number of tragedies would no doubt be many more.

During the two year period there were 41 fatal and 835 non-fatal accidents. There was one fatality for every 40,834 hunters, based on the two year average of 837,105 gunners. A 28 year compilation (1924-1951) disclosed an average of 39 fatal accidents annually, 43.2% of which were self-inflicted. During this long period the average was one fatality for every 16,376 hunters, based on an average of 639,242 gunners.

The Commission commends all safe hunters and urges them to impart their wisdom, knowledge and experience to the young crop of nimrods in the making.

#### LIST OF HUNTING ACCIDENTS DURING THE PAST NINE YEARS

	1943	1944	1945	1946	1947	1948	1949	1950	1951
Self-inflicted:									
Fatal .....	7	10	14	15	8	6	10	4	1
Non-fatal ...	38	36	36	66	66	67	71	69	8
Inflicted by others:									
Fatal .....	20	13	23	14	21	17	15	12	1
Non-fatal ...	153	173	196	271	360	351	382	380	30
Totals ..	218	232	269	366	455	441	478	465	41

Licenses issued: 582,734 607,900 713,621 856,020 850,435 882,925 839,942 834,172 840,03

**GAME KILL**

Hunters reap more than just game in the bag, such as wholesome outdoor recreation, good companionship, etc., but they too often forget these benefits and measure success by the size of their bag. So the Commission must manage its program carefully and wisely to provide an adequate supply of wildlife to satisfy the fellows who pay the bill. Someday when they reach the rocking chair stage of life they will realize there were other dividends which accrued to their pleasure besides so much game in the pot.

A quick summary shows that the kill of turkeys, ruffed grouse, ringnecks, quail, rails, gallinules, coots, wild waterfowl and doves increased over the previous two-year period. There was a decrease in the kill of deer, bears, rabbits, hares, Hungarian partridges, squirrels, raccoons, woodcocks and woodchucks. Although the number of pieces of game killed during this period fell short of the 6,559,760 killed during the previous two years, it was nonetheless a bountiful harvest.

The figures on the big game kill are based on individual Game-Kill Reports while the small game kill was based on the field officers' estimates. The table below shows the kill by species and years:

<i>Species</i>	<i>Season of 1950</i>	<i>Season of 1951</i>
	<i>Number</i>	<i>Number</i>
Deer, Legal Antlered .....	23,302	34,582*
Deer, Legal Antlerless .....	31,515	37,952
 Total Deer .....	54,817	72,534
Bears .....	354	429
Rabbits .....	1,553,968	1,258,246
Hares (Snowshoes) .....	1,445	1,506
Hungarian Partridges .....	15	69
Squirrels .....	546,574	541,158
Raccoons .....	74,649	99,413
Wild Turkeys .....	5,278	8,962
Ruffed Grouse .....	36,403	45,250
Ringneck Pheasants .....	353,279	385,598
Quail .....	4,461	7,363
Woodcocks .....	17,500	14,409
Rails, Gallinules and Coots .....	4,925	6,755
Grackles (Blackbirds) .....	#	#
Wild Waterfowl .....	52,519	56,529
Woodchucks .....	251,648	258,314
Doves .....	10,533	8,215
 Total Number .....	2,968,368	2,764,750

\*Includes 33 deer killed during the Special Archery Season.

#Unprotected—No data.



### ANTLERLESS DEER SEASONS

Deer, still too numerous for their food supply in many sections, required additional cropping and special antlerless deer seasons were established in 1950 and 1951 to accomplish that purpose.

#### 1950

The special season in 1950 was held November 27 and 28 just ahead of the buck season beginning on the 29th. No special deer permits were required and nonresident hunters were permitted to participate.

The Commission's action evoked the usual controversy and regular abrogation petitions were filed by residents of Bedford, Cameron, Centre, Clearfield, Clinton, Elk, Franklin, Fulton, Juniata, Mifflin, Perry, Pike, Snyder and Sullivan counties, who held licenses during 1949, or who otherwise were qualified, which automatically closed these counties. A number of petitions from other counties also were filed, but they did not meet the requirements of law. The season applied to 53 of the 67 counties, and 31,515 antlerless deer were killed.

#### 1951

1951 season was held December 14 and 15 but it was established under new amendments to section 501 of the Game Law which required that Special Licenses costing \$1.10 should be issued in such numbers as is deemed necessary to limit the number of persons who may hunt for antlerless deer in any county. The quota established for 66 counties (Philadelphia County was excepted) was 225,000 of which 223,070 licenses were issued and 37,952 deer taken.

In the opinion of the Commission not enough deer were killed in both seasons to correct the situation and it will be necessary to establish another antlerless season during 1952.

### FINANCIAL OPERATIONS

The financial status during the period covered by this report is set forth on charts and detailed tabular statements which appear in the appendix and in summarized form as follows:

During the first year the sum of \$3,796,733.03 was credited to the Game Fund, the second year \$4,147,253.19, or a total of \$7,943,986.22.

Expenditures for the first year were \$4,028,782.81, the second year \$4,248,617.01, or a total of \$8,277,399.82.

This is the first biennial period in which the financial operations were based on the increased license fees which became effective September 1, 1949. The previous biennium (1949-1950) included one year's operations at the old license fee (\$2.00 for resident and \$15.00 for nonresident) and one at the increased fees of \$3.15 resident and \$20.00 nonresident.

The comparative figures below will be of interest:

<i>Biennium</i>	<i>Revenue</i>	<i>Expenditures</i>
1938-40 .....	\$3,016,911.71	\$2,945,213.83
1940-42 .....	3,309,727.38	2,918,605.44
1942-44 .....	3,068,006.83	2,427,912.20
1944-46 .....	3,294,685.42	2,871,370.06
1946-48 .....	4,726,918.63	5,326,214.28
1948-50 .....	6,583,771.89	6,687,360.53
1950-52 .....	7,943,986.22	8,277,399.82

### EARMARKED FUND

Under the Game Law not less than \$1.25 from each resident hunter's license fee shall be used for improving and maintaining natural wildlife habitat on land that is available for public hunting; the purchase, maintenance, operation, rental and storage of equipment used in this work; the purchase, distribution, planting, cultivating and harvesting of game foods; the purchase, trapping and distribution of all species of game; and protecting the property of Farm-Game Cooperators.

The table below shows the expenditures in relationship to the minimum amount required by law during the three years this program has been in operation:

<i>Year Ending</i>	<i>Expenditures</i>	<i>Minimum Amount Required</i>
May 31, 1950 .....	\$1,211,687.72	\$1,012,917.50
May 31, 1951 .....	1,266,856.18	1,000,696.25
May 31, 1952 .....	1,095,482.26	1,012,528.75
Totals .....	\$3,574,482.16	\$3,026,142.50

\$548,399.66 in excess of the minimum required by law was used to conduct this special program.

### STATUS OF GAME FUND

More money was spent during this period than any time in the Commission's history. Not only was all the current revenue of \$7,943,986.22 absorbed, but an additional \$333,413.60 was expended from the cash balance of \$1,722,982.94 left over from the previous biennium. Despite the expanded program, there was a sufficient operating balance of \$1,398,569.34 remaining on June 1, 1952, to finance the continuing programs on a pay as you go basis from June 1 through September 30, when the funds from the new licenses became available.

### CAPITAL INVESTMENTS

The table below gives the actual consideration paid for land purchased to date together with the estimated value of other capital items as of May 31, 1952:

State Game Lands (1920-1952) .....	\$4,268,197.68*
Buildings on State Game Lands .....	131,945.00#
Game Propagation Farms (including land, buildings, and equipment) .....	523,715.04#
Equipment (including automobiles, trucks, tractors etc.) .....	332,682.62#
Total .....	\$5,191,657.44

\*Consideration paid for lands (including title and survey costs).

#Estimated value as of May 31, 1952.

Tables 1, 2 and 3 on pages 120 to 125 inclusive give information on expenditures for maintenance and replacement of certain capital items, money for which must be allocated from current revenue.



Photo by Walter A. Romanski, Reading Eagle.

## Public Relations

The Game Commission greatly increased its output of wildlife information, particularly through press and radio services. Wishing to keep people interested, cooperative and helpful it utilized these and other channels to inform the general public on wildlife projects, problems and developments. The columns and programs of Outdoor Writers, particularly, were improved and increased, due to the greater flow of factual material to them and the splendid cooperation received from them. More frequent visits with them by Commission personnel resulted in a better understanding of Pennsylvania's wildlife problems and an improved job of imparting this information to their readers.

All public relations and wildlife conservation efforts have been directed toward providing current and accurate wildlife information to the public for the purpose of educating the people in wildlife needs and enlisted their sympathy and help in the broad conservation programs.

In addition to conducting many programs before schools, sportsmen's organizations, service clubs, granges, youth groups and others, the Conservation Education Assistance became well acquainted with the Outdoor Writers, radio commentators and newspaper editors in their sections which paid off in a more sympathetic and enlightened public. Due in large part to the efforts of the Division Supervisors who themselves assumed a leading role in the "know your outdoors better," program, District Game Protectors participated to a much larger extent in improving the Commission's service to those who disseminate wildlife information to all.

The number of wildlife news releases sent to outdoor writers, commentators and newspaper editors from the central office of the Commission increased considerably and the quality was improved. Numerous items, more local in nature, were distributed to newspapers in their administrative areas by division office personnel. They and the District Game Protectors also participated in many radio programs and some telecasts dealing with wildlife, hunting safety, the game law, and regulations on game and fur seasons.

The net result of this cooperative work has been a better coverage of the state's wildlife program by the press and other public information mediums, through which the people are kept abreast of events, developments and progress.

## Conservation Education

More emphasis was placed on conservation education than ever before on a state-wide, all-age coverage.

Realizing that much success of any wildlife program is measured by the interest of those who have the greatest stake in its future, and who are better able by their youth and energy to physically and morally insure its perpetuation, the Commission aimed its efforts toward at least two youth groups—the Future Farmers and the school children.

A program for Future Farmers was established April 1951, with the co-operation of the Department of Public Instruction so that upwards of 12,000 potential farmers annually would have an opportunity to improve conditions for wildlife on their farms in competition with each other for cash awards. Those awards, totalling \$1,000, were subsidized by the Commission and will be presented to the winners at the close of the school term in 1952.

A careful study was made of the programs of all the Federal, State and private conservation agencies in the Commonwealth to learn what each is doing. The extent to which 26 organizations concerned are working to conserve the natural resources was so enormous that an article divulging their activities was prepared and published in the April and May 1951 issues of **GAME NEWS**. By being familiar with each other's programs, policies, publications, etc., and by knowing how each one can help the other, the conservation program can progress more rapidly in the years to come.

A close liaison was maintained with the Department of Public Instruction which helped screen the Commission's numerous publications so that maxi-

Photo by Hain Wolf.

Twenty-one different breeds of hunting dogs were displayed at the State Farm Show in January 1952. The performance was witnessed by several thousand persons. Above Herbert Kendrick, editor of the Dog Column in **Pennsylvania Game News**, learns from John Herman, member of the Game Commission, some of the hunting characteristics of his German Weimaraner.



mum teacher-pupil use could be derived from them. Wildlife conservation is now inculcated in nearly every portion of the elementary courses of study and in the science courses.

The Department of Forests and Waters and the Fish and Game Commissions cooperated in the preparation, and agreed to finance the publication of a manual for Jr. Sportsmen's Clubs which is to keynote an aggressive state-wide program for young sportsmen. Work on the manual is under way and it should be available sometime during the 1952-53 school year.

The Commission again contributed \$1,000 toward the operation of the Conservation Laboratory at State College, so that more teachers can become better equipped to discuss the natural resources with their pupils. During the two summer sessions in 1952, 62 teachers were enrolled in the outdoor workshop; in 1951 61 attended.

It would be very helpful if all teachers had a conservation background *before* they entered their profession. It is encouraging therefore to note that one State Teacher's College has included an outdoor laboratory as a part of its extra curriculae activities—The West Chester State Teacher's College, West Chester, Pennsylvania.

Outdoor workshops recall another splendid conservation endeavor—the Jr. Conservation Camp sponsored every summer by the Federation of Sportsmen's Clubs. The camp is located at the State College Forestry Camp, several miles southwest of State College. In 1951 there were four groups representing a total of 130 boys. Each group received approximately 12 days instruction between June 10 and July 27, 1951. In 1952 there were four groups of boys, totaling 156. The camp period began June 8 and ended July 31, 1952.



Photo by Ralph Cady.

Members of the Penna. State Archery Association provided thrills for many on-lookers as they demonstrated their skill with the bow and arrow in the State Farm Show Arena.

The Game Commission was assigned one and one-half days of each 12-day period for its part of the over-all conservation program. The boys were instructed in firearms safety and hunting courtesy, and received rifle instruction, which included actual firing on the range and the opportunity to qualify for a National Rifle Association Ranger Medal. Predator trapping with a practical demonstration was also given. One evening was devoted to an open forum discussion of field problems of the Commission, or habits of wildlife, followed by motion pictures. The Executive Director and staff members visited the camp and addressed each class. The Commission's part of the program ended with a field safety and wildlife identification problem. Prizes were awarded for rifle shooting and the field problem. While this program is subsidized by the Federation, all the conservation agencies contribute physically and materially to it through their personnel, instruction, literature and visual aids.

Other agencies were also encouraged to foster conservation education programs and cash subsidies were furnished to a number of them for this worthy purpose. The Carnegie Museum, Pittsburgh; The Academy of Natural Sciences, Philadelphia; and the Forensic League of the University of Pittsburgh were all cooperators in this supplemental undertaking.

In order to make the GAME NEWS more interesting and attractive, and easier to handle and carry, several new features were added, the format was changed, and the size reduced from  $8\frac{3}{4}'' \times 11\frac{3}{4}''$  to  $6'' \times 9''$ . These changes resulted in greater circulation. From a paid circulation of 44,169 on September 1, 1950 the number of readers increased to 51,724 as of June 1, 1952, an increase of 7,555. Subscriptions received from June 1, 1950 to June 1, 1952 amounted to \$61,697.04.

Special issues and inserts were printed to disseminate important information. For example regular Commission bulletins which heretofore were published separately, in limited numbers, were released as Special Issues of the magazine at the rate of two a year, thus giving every subscriber 14 issues instead of 12. In addition educational inserts, many of them in color, were prepared on specific subjects or projects. The inserts, usually numbering four to sixteen pages, were subsequently reprinted for school and other educational use.

Special issues and inserts published under the new format are as follows:

*Special Issues*

Deer Problem  
Year-Round Pleasures for Sportsmen  
Our Wildlife Heritage  
Bobwhite Quail

*Special Inserts*

Biennial Report  
Autumn Food for Wildlife  
Farm Youth & Wildlife  
Penn. Wildlife & Its Tracks  
The Ringneck Pheasant in Penn.  
Penn. Springtime Birds  
Attracting Birds  
Some Penn. Snakes  
Ruffed Grouse

Special issues may be obtained in reasonable quantities by teachers and club leaders, etc., at no cost.

For those who are interested in the state's wildlife, its protection and perpetuation, and conservation in its many phases, we recommend the Pennsylvania GAME NEWS. Subscription rates are \$1.00 for 1 year; \$1.50 for 2 years; and \$2.00 for 3 years, with a special rate of 50 cents a year for

sportsmen's clubs and youth groups which send in 10 or more subscriptions at one time.

Occasionally publications do not lend themselves to publication as Special Issues of GAME News. One book was prepared and released which will appeal to all bird lovers—"Birds of the Pymatuning Region" by Wm. Grimm. It contains 226 pages, 8 beautiful color plates and a profusion of excellent photographs and line drawings. It costs \$1.00 and can be obtained at the Commission's offices in Harrisburg or at the Pymatuning Waterfowl Sanctuary, Linesville, Crawford County, where the Commission employs a naturalist-lecturer every summer to acquaint the thousands of visitors with the natural history of that wildlife paradise.

"Pennsylvania Wildlife," a 48 page booklet on the early history and current program of the Commission, replete with 21 color plates of game birds and animals and fur-bearers, was completely rewritten and is now available for 25 cents a copy.

"Pennsylvania Birdlife," containing 6 full color plates of 124 species and 80 photographs, also was revised and reprinted. It sells for 50 cents a copy. These publications are extremely informative and popular.

Many persons who read this report will be familiar with the first set of 4 color bird charts the Commission published for school use several years ago. They consisted of a chart on game birds, one on hawks, one on winter birds and one on summer birds. They sell for 50 cents each or \$1.50 per set of four. It will be good news to learn that these charts, long out of print, were again published and are now available.

It will be even better news to many, especially teachers, to know that a companion set of four color charts, including one on owls, another on summer birds and two on game and fur-bearing animals, were published a few months ago and are available at \$1.50 per set. They proved so popular that several state conservation departments and the National Audubon Society reprinted them by special permission. A list of the Commission's free and paid literature will be furnished upon request.

Some indication of the demand for paid literature can be obtained by scrutinizing the following list. In the 24 months covered by this report \$9,381.40 was transmitted to the Department of Revenue for the sale of these publications:

1,587 Sets	Bird Charts
518 Sets	Mammal Charts
437 Single	Charts
1,138 Sets	Conservation Series
6,532 Copies	Pennsylvania Birdlife
1,115 Copies	Pennsylvania Birds of Prey
3,511 Copies	Pennsylvania Wildlife (No. 18)
2,062 Copies	Sportsman's Guide to Wild Ducks
859 Copies	Farmer and Wildlife
10 Copies	Legal Procedure
627 Copies	Sportsmen's Maps
3 Copies	Birds of the Pymatuning Region
4 Copies	Bulletin No. 19
20 Copies	Bulletin No. 17
4 Copies	Bulletin No. 15
100 Copies	Predaceous Animals
814 Copies	September (1950) Special Issue GAME NEWS
581 Copies	March (1951) Special Issue GAME NEWS

The demand for good educational motion pictures becomes greater every year, and our ability to provide them is taxed more and more. We produced only three films ourselves during the biennium—a short classroom picture titled "Birds of Home and Garden," which contains the actual bird songs as background music; "Days Afield," a pleasant, colorful picture on pheasant, rabbit, squirrel, woodcock and wild turkey hunting; and "Farmer Brown and Me," a delightful story for youngsters about the wildlife that a garrulous old barn owl observed from his home in Farmer Brown's loft.

Three additional pictures were completed and will be released soon. One of them is a 400 ft. sound and color film on "How to Shoot Safely." Another teaches the fundamentals of archery, and the last is a duck hunting saga of the Susquehanna River.

Although the demand for wildlife and natural history subjects for TV purposes is considerable, it will become much greater as more ultra-high frequency stations are established. With this in mind many of our future productions will include short sound reels which can be used on television. The Commission has qualified cameramen in each of the six field divisions. These employees, officially designated as Conservation Education Assistants, contribute much interesting and educational material.

Films were acquired from outside sources as follows:

Sunrise Serenade .....	800 ft., color and sound
Prairie Wings .....	800 ft., color and sound
Spotty the Fawn .....	400 ft., color and sound
The Adventures of the Outdoor Kids .....	1200 ft., color and sound
Shooting Safely .....	1200 ft., color and sound
The Beaver .....	400 ft., color and sound

"The Adventures of the Outdoor Kids" which parallels the page on "Outdoor Kids" appearing as a regular feature in the GAME NEWS, was produced for the conservation education of the youth of the Commonwealth.

Some idea of the extent to which our motion pictures were used can be ascertained to a degree from the activity reports of the six Conservation Education Assistants. In the aggregate these men appeared at more than four thousand meetings, attended by hundreds of thousands of persons. They're performing a great conservation education service.

Following are the groups before which they appeared:

High Schools .....	424
Grade Schools .....	85
Sportsmen's Groups .....	2552
Civic Groups .....	516
Youth Groups .....	90
Farmer's Groups .....	209
Colleges .....	10
Exhibits .....	34
Radio-TV .....	20
Trapping Demonstrations .....	64
<hr/>	
Total Meetings .....	4004

Civic groups include such organizations as Rotary, Kiwanis, Women's Clubs, etc.

Youth groups include Granges, Scouts, Future Farmers, 4-H Clubs, etc.

Visual aids are not confined to motion pictures. Approximately five thousand 35mm kodachrome slides were acquired for special classroom lectures and for use in the four Admatic Machines which are used at large sportsmen's gatherings, teacher's institutes, youth conferences and other occasions where the conservation message may be effectively portrayed. The Admatic Machines accommodate 30 slides and contain a record player which narrates each subject as it appears on the screen. This equipment is so versatile that it is possible to synchronize bird songs with slides of the actual songsters in this light, easily portable device.

Many still pictures were also obtained for illustrating the Commission's publications and to provide embellishment for exhibits and other special purposes.

Laboratory work for these purposes necessitated the enlarging of more than 2500 pictures mostly 8" x 10"; the contact printing of over 8400 subjects, principally 2" x 2" and 4" x 5"; the developing and processing of more than 5600 negatives, and much copy and related work. In addition 82 color transparencies size 11" x 14" and 12" x 20" were prepared especially for display purposes at the several major exhibits.

The Commission has always believed in the old philosophy that "seeing is believing" and its three major wildlife exhibits displayed at the State Farm Show, Harrisburg; Allegheny County Free Fair, Pittsburgh; and the Motor Boat and Sportsman's Show, Philadelphia, strengthened that belief the past two years because they attracted more people than ever before. Each exhibit was planned with specific viewer interest in mind. For example the Farm Show exhibition was geared to the Future Farmers of America program and showed what can be done to improve conditions for wildlife on the land; while farmer-sportsman relations and safety first were emphasized at sportsmen's exhibitions.

Through the cooperation of the State Farm Show Commission we were permitted to use its small arena on two evenings during the Farm Show of 1951 and 1952. By carefully planning programs designed to appeal to certain groups the arena was filled on all four occasions. The subjects presented were lively, interesting and educational. Expert trappers disclosed the tricks of their trade even to the proper skinning, fleshing and drying of the pelts. All of the numerous breeds of hunting dogs were displayed, their owners describing briefly the hunting techniques of each breed. Professional archers gave a demonstration on bow and arrow shooting. Humorous skit on sportsmanship vs vandalism and safety first were enacted by Game Protectors. This type of circus-ring demonstration is dramatic and effective and leaves lasting impressions on the public. They are worthy of consideration by sportsmen's groups which hold shows in armories or other large facilities.

Two years ago the Hershey Estates, Hershey, Pennsylvania, turned large building over to the Commission free of charge for exhibition purposes. Since then dozens of outstanding educational displays have been installed in the museum and more are being contemplated. Hundreds of thousands of people visit this conservation education display every year, many of them school children. The admission is free. When in the Chocolate City visit it. You will be more than welcome.



Photo by Willard Johns.

Members of the sixth student class of the Ross Leffler School of Conservation. These men completed their year's course of instruction in April 1951 and now are undergoing a twelve-months probationary period as Game Protectors.

## The Ross Leffler School of Conservation

A Game Protector is so much more than a law enforcement officer. He must be familiar with all phases of the Commission's program and be qualified to administer them at the local level. Some people are amazed to learn that a student officer must undergo a year's intensive training in classroom instruction and field work before he is prepared to assume the responsibilities of a Game Protector. The Commission also requires an additional year of satisfactory probationary service before a man is accepted to perform the high standards of his profession.

On April 25, 1951, twenty student officers comprising the Sixth Student Class completed a year's course of instruction at the school and were assigned to duty in the field as probationary Game Protectors. The Seventh Student Class composed of 17 members selected competitively from Deputy Game Protectors and Food and Cover Corpsmen commissioned or employed prior to January 1952, was enrolled on May 25, 1952.

Special sessions also were held for in-service personnel as follows: Three for research employes on November 20 and 21, 1950; May 14 and 15, 1951; and November 16 and 17, 1951. Beginning June 3, 1951, five refresher classes each of one week duration were held for salaried field officers. In addition two classes were held for Deputy Game Protectors and one for Food and Cover Foremen.

## Wildlife Research Division

Scientific wildlife management is based upon facts discovered through study and experimentation. The Wildlife Research Division is the experimental and fact-finding group of the Game Commission. Its first function is to furnish information which, when properly utilized, will provide better hunting for the sportsmen of Pennsylvania and better protection for all desirable wildlife. And its second obligation is to see that this management of the state's wildlife is carried out as efficiently and economically as possible.

Within the past two years many research studies have been undertaken and several have been completed. Some have been financed by the aid of Pittman-Robertson funds, wherein the Federal Government paid seventy-five per cent of the cost; others have been financed entirely by Game Commission funds; and still others have been contributed by the Pennsylvania Cooperative Wildlife Research Unit at State College.

Studies which have been completed during the biennium include the following:

1. Survey of Pennsylvania Mammals—Regional surveys for the northcentral, southcentral, northeastern, and southeastern parts of the state were completed. These surveys provided factual information concerning the range abundance, habitat preferences, life histories, ecological relationships, and economic importance of all the mammals in the Commonwealth. This information is necessary for the intelligent management of our wildlife resources. All regional survey reports are printed.

2. Cottontail Rabbit Management Studies—Three studies of the cottontail in three different parts of the state were designed to discover the procedure necessary to restore harvestable rabbit populations upon nonproductive abandoned land, and to ascertain the costs of these management measures. These techniques can be applied by the Game Commission and sportsmen's clubs to increase the shootable supply of cottontails. The studies are now complete and the final reports are being written.

3. A Study of Environmental Control on Forested Lands for Game Management—A comparison was made between bulldozing, cutting, and fire as methods for creating food and cover for forest-dwelling game. The final report has been printed.

4. Research Studies of Predators and Predator Control Methods—All available food habits tables for the predaceous animals of the fourteen northeastern counties of the state were compiled and published in a single bulletin. Also, the literature was searched for present and past concepts concerning predators, predation, and predator control methods. This analysis was intended to serve as a guide for future predator control and studies.

Pennsylvania's bounty system was surveyed and analyzed to discover means for increasing the efficiency of the system in the control of predator animals and for reducing the costs of control wherever possible.

5. Survey of Pennsylvania Migratory Waterfowl—The abundance and distribution of waterfowl in Pennsylvania during the nesting season and during the fall migration period were determined. Also, the state was surveyed for possible nesting, feeding, and resting sites with the intent that these should be managed for waterfowl.

*Studies currently in operation are:*

(1) White-tailed Deer—Pennsylvania's deer herd poses an unusual problem in wildlife management. Game manager's are normally faced with the prob-



Photo by D. L. Batcheler.

*Deer replace their own ranks rapidly even in the face of terrific hunting pressure and inter starvation. For these reasons control measures of one kind or another are always necessary.*

ms of increasing the numbers of a game species, but, in the case of the deer, their principal problem has been to decrease the herd to a point commensurate with its natural food supply. The present project is designed to provide factual information to be used for the scientific management of this important game animal. It is necessary to know the distribution and relative abundance of deer in different parts of the state so that they can be harvested in respect to their numbers. It is essential to know the effect of poor food conditions upon the body weight, antler size, reproduction, and health of the deer. Also, it is imperative to evaluate the damage by deer to farm crops and forest growth. These and many more economic and biologic facts concerning deer in Pennsylvania are being collected for guidance in managing the herd.

(2) Wild Turkey—The intent of this study is to reappraise the range and show the distribution of wild turkeys on maps; to determine why wild turkeys have declined on the long-established range of south central Pennsylvania; to determine the value of farm-reared birds in management; and to investigate the practicality of using artificial insemination as a means of producing better quality birds at the Wild Turkey Farm at reduced cost. The recent expansion of the wild turkey range to almost all parts of the state has placed even greater emphasis upon the importance of this bird for recreation. Continuing research studies are necessary for sound management.

(3) Rabbit Trapping and Transfer Program—By tagging and marking with bright-colored dyes a large number of trapped rabbits, an attempt is being made to determine the fate of these animals after release. How many survive and what contribution do the survivors make toward the hunting season kill? The answers to these questions may greatly influence the future management of the cottontail in Pennsylvania.

(4) Woodcock—The life of woodcock coverts appears to average about fifteen years. After this time, the alder, aspen, or sumac appears to shade out the ground cover and make the area undesirable for these birds. The principal function of this study is to determine the procedures necessary to restore these "worn out" coverts to productivity. Also, constant checks will be made of population changes, causes of mortality, seasonal movements, and other factors of importance to proper management.

(5) Safety Colors for Hunting Clothing—The need for brightly colored hunting clothing is indicated by the hunting casualty record each year. Sitting woodcock hunters are shot through the head because their hatless head resembles the body of a woodchuck. Small game and big game hunters are shot in mistake for game or because they are not readily visible. Experiments are being conducted to determine the colors which contrast best with natural backgrounds, and colored movies and slides are being prepared to demonstrate the value of this brightly colored garb in hunting safety.

(6) Other miscellaneous studies include: (a) An examination of several hundred wings and tails from grouse shot by hunters to learn the age and sex of the fall population. This provides direct evidence concerning the success of the past hatching and rearing season, and indirectly the status of the grouse cycle. (b) Numerous examinations are being made of diseased animals. Species included are foxes, deer, grouse, cottontails, raccoons and wild turkeys. (c) Constant attention is given by the Wildlife Research Division to the presentation of recommendations for improving the efficiency or effectiveness of the wildlife management program in the state. Method and techniques are being developed continually to provide better hunting and better protection to wildlife at less cost.

*The woodcock or timber-doodle provides excellent sport for quite a few nimrods and efforts are being made to improve food and environmental conditions for him.*

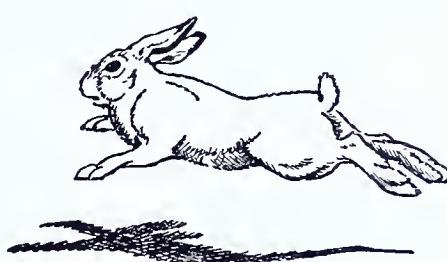


## COOPERATIVE STUDIES

The Cooperative Wildlife Research Unit at The Pennsylvania State College conducts studies in cooperation with the Wildlife Research Division. Those currently in force are: (1) A study of the Parasitological, Pathological, and Biochemical Factors Affecting the Grouse Cycle; (2) An Analysis of the Factors Responsible for Antler Growth in Deer; (3) An Economic Analysis of Deer Damage to Farm Crops as related to Income from Deer Hunters; (4) An Appraisal of Deer Damage to Forest Reproduction in Pennsylvania; (5) A Survey of Deer Damage to Coniferous Planting; (6) Antibiotic Studies in Bobwhite Quail; (7) A Study of Fertilizer Treatments on Beech and Various Oaks to Determine Any Increase in Mast Production; (8) A Study of the Flowering and Post-Flowering Periods of the Oaks, Hickories and Walnuts with Reference to the Forecasting of Mast Production.

Several research bulletins were published by the Wildlife Research Division during the biennium. Besides these, articles by research staff members appeared in the *Journal of Mammalogy*, *The American Midland-Naturalist*, *the Journal of Wildlife Management*, *Ecology*, and *the Journal of Parasitology*. The complete research bulletins are:

- Forbes, Stanley E. 1952. The Bulldozer—A Tool of Wildlife Management. Final Report, Pittman-Robertson Project 31-R. 136 pp.
- Gifford, Clay L. and Ralph Whitebread. 1951. Mammal Survey of South Central Pennsylvania. Final Report, Pittman-Robertson Project 38-R. 75 pp.
- Grimm, William C. and Ralph Whitebread. 1952. Mammal Survey of Northeastern Pennsylvania. Final Report, Pittman-Robertson Project 42-R. 82 pp.
- Latham, Roger M. 1950. Pennsylvania's Deer Problem. Research Report, Pennsylvania GAME NEWS—Special Issue No. 1. 48 pp.
- Latham, Roger M. 1950. The Food of Predaceous Animals in Northeastern United States. Final Report, Pittman-Robertson Project 36-R. 69 pp.
- Latham, Roger M. 1951. An Analysis of the Pennsylvania Bounty System. Final Report, Pittman-Robertson Project 44-R. 35 pp.
- Latham, Roger M. 1951. The Ecology and Economics of Predator Management. Final Report, Pittman-Robertson Project 36-R. 96 pp.
- Latham, Roger M. and C. R. Studholme. 1952. The Bobwhite Quail in Pennsylvania. Final Report, Pittman-Robertson Project 16-R. 95 pp.
- Roberts, Harvey A. and Robert C. Early. 1952. Mammal Survey of Southeastern Pennsylvania. Final Report, Pittman-Robertson Project 43-R. 70 pp.
- Roslund, Harry R. 1951. Mammal Survey of North Central Pennsylvania. Final Report, Pittman-Robertson Project 37-R. 55 pp.
- Warren, Carl R. 1950. Survey of Pennsylvania Migratory Waterfowl. Final Report, Pittman-Robertson Project 30-R. 35 pp.



# BUREAU OF WILDLIFE CONSERVATION

## Land Utilization Division

### GAME MANAGEMENT ACRES ACQUIRED

The future of wildlife and the recreation it affords have been made safe in Pennsylvania for all time because of a far-reaching land acquisition program which began back in 1920.

Since that time 900,363.95 acres have been added to the sportsman's bank at a cost of \$3,364,730.70 or an average of \$3.74 per acre. Even if the cost of securing options, examining land, abstracting and conveying titles, surveying boundary lines, mapping, etc., were included in this figure the overall would be infinitesimal compared to the dividends that have and will accrue from these vast holdings in the years to come.

During the two-year period under consideration 19,926.24 additional acres were acquired at a cost of \$95,357.55 and an additional 3,418 acres were under contract for purchase at the close of the biennium.

Probably the most important and by far the largest land acquisition made was 10,484.4 acres which became a part of Game Lands No. 141 in Carbon County. This large area will provide additional public shooting grounds in a rather thickly populated section—a most desirable asset. For more detailed information on Game Lands please refer to table No. 4 on page 126.

### FIXED CHANGES IN LIEU OF TAX

Commonwealth owned lands are exempt from taxation but the Commission pays annually a fixed charge of 7½ cents for each acre of Game Lands and Game Farms it acquires. Two and one-half cents each are paid to the County Treasurer, the Township School Directors and the Township Road Supervisors for every acre acquired in the respective counties and townships. Fixed charges are paid during calendar years and 64 counties received \$43,657.13 and \$66,573.88 respectively during 1950 and 1951. A grand total of \$701,981.74 has been paid on Game Lands and Game Farms since lands were first purchased by the Commission.

### AUXILIARY GAME REFUGE PROJECTS (General Classification)

The number of Auxiliary Projects decreased from 31 to 27, with a net loss of 1,639 acres. The 27 projects contain a total of 22,278 acres, of which 4,930 acres are maintained as refuges and 17,348 acres are open to hunting.

### GAME PROPAGATION AREAS

Game Propagation Areas increased from 132 to 283 in number and from 30,280 to 54,456.49 acres; including 286 rabbit farms, initially authorized by the Commission on October 6, 1949, containing 31,540.17 acres.

### SPECIAL PRESERVES

Nine dog training projects, having a total area of 6,346 acres, are in operation.

Two Archery Preserves established in 1937, the maximum permitted by law, are still maintained on 1,685 acres.

For more detailed information concerning the location and size of Special Preserves, see Table No. 6 Pages 128.



Photo by D. L. Batcheler.

*Wild turkeys have increased their range and multiplied considerably as a result of carefully planned restocking programs.*

#### SPECIAL WILDLIFE PROJECTS

New projects were established and others were discontinued. The records indicate that 93 projects, totaling 32,295 acres, were operative at the end of the biennium.

#### SUMMATION OF ACREAGE IN LAND MANAGEMENT PROJECTS

Lands either owned or under nominal control of the Commission and used for game management projects of various types, including Game Farms and primary refuges located within State Forests and other public lands, aggregated 2,058,212.44 acres, an increase of 308,287.44 acres. The various classifications and acreages involved are indicated in concise form in Table No. 5 page 127.

#### EASEMENTS GRANTED

Forty-six easements, mostly for rights-of-way for oil, gas, electric and telephone lines, comprising 1,151.2 acres across Game Lands and Game Farms were granted. The Commission received \$1,431.23 for forest growth cut on these areas. Rentals paid for all existing rights-of-way totaled \$10,881.97.

#### ENGINEERING UNIT

##### *Field Work*

Boundary surveys were completed on 50 tracts under contract for purchase, totaling 29,372 acres located in 18 counties. Four hundred and thirty-four miles of lines were surveyed to establish 281 miles of boundaries, bringing the total outside boundaries of the Game Lands to approximately 4,072 miles.

Thirty-one miles of boundaries were re-surveyed to settle adverse claims and 122.8 miles retraced for painting and posting.

Thirty-three miles of road were surveyed and mapped and food plot sites located for mapping purposes.

Engineering surveys were provided for the construction of a dam on State Game Lands No. 183, Pike County.

The boundaries of two primary refuges on State Forest Land were surveyed for relocating.

#### Office Work

Fifty additions to Game Lands were plotted, traced, areas calculated and deed descriptions prepared. Warrant data was abstracted and mapped and survey information prepared for the abstractors and surveyors.

Forty-one tracings of Game Lands which had become damaged or obsolete were revised and retraced.

A 1952 edition of the Sportsman's Map was prepared and printed. It can be obtained from the Harrisburg or the field division offices for 15 cents.

Twenty-four county maps showing Game Lands, roads, streams and other topographic features were prepared for the GAME NEWS.

Twenty-five hundred and fifty-seven farms were mapped and printed for the Farm-Game program, involving 270,927 acres and requiring 45 composite maps.

Sketches were prepared for 10 propagation areas, 153 rabbit farms and five waterfowl areas. Plans for food and cover improvements were mapped on 51 rabbit farms, covering about 5,000 acres.

Photo by Ralph Cady.

*Rabbit Farms from which surplus animals were trapped either by the landowner or the Game Protector are used to restock depleted areas.*



Thirty-three small scale composite maps of Game Lands were drafted for public use.

Plans were prepared for two new buildings, and the plans of several existing buildings revised.

Work on the aerial photographs continued, outlining the boundaries of Game Lands, counties and townships and noting the names of streams and towns. Many photos were especially prepared for food and cover improvements. Numerous signs, charts, posters, graphs, plans for traps and other drawings were prepared for other units of the Commission. About 10,000 square yards of print paper was used for furnishing maps and plans to the field officers and others.

Plans for a dam along a state highway on Conneaut Marsh were prepared and submitted to the Department of Highways for approval.

#### FARM-GAME COOPERATIVE SECTION

Due to its increased popularity, the Cooperative Farm-Game Program was expanded by the addition of 13 new projects consisting of 692 farms, containing 94,896 acres, thus bringing the aggregate of leased hunting territory to over 1,000,000 acres.

Rough mapping of all additions was completed in the field and final prints prepared by the engineering unit.



Photo by D. L. Batcheler.

*Field workers of the Commission assist farm-game cooperators in laying out their lands on the contour.*

### *Meetings*

Project personnel participated in 464 meetings of Sportsmen, Farm Groups and Soil Conservation Districts attended by 23,878 interested persons. They also participated in 236 in-service training meetings.

### *Farmer Contacts*

During the period the following farmer contacts were made:

By District Game Protectors .....	14,564
By Food and Cover Corps .....	31,720

### *Refuges*

The following refuges were established, maintained or removed:

Established .....	37 containing 431 acres
Removed .....	41 containing 314 acres

At present there are 730 refuges containing 6,984 acres, all of which were maintained.

### *Safety Zones*

A total of 10,707 safety zones were posted with safety zone signs.

### *Wildlife Management and Soil Conservation Practices*

Field personnel, in an effort to improve wildlife habitat on farm areas, assisted project cooperators establish the following practices:

1. Contour strips surveyed on 13,807 acres
2. Seedlings distributed to farms:

a. Coniferous .....	1,963,775
b. Multiflora Rose .....	1,110,620
c. Other Species .....	180,101
Total .....	3,254,496

3. Seedlings planted by Commission personnel:

a. Coniferous .....	4,450
b. Multiflora Rose .....	318,575
c. Other Species .....	12,318
Total .....	335,343
	3,254,496
Grand Total .....	3,589,839

4. Food Strips—The following game food strips and nesting cover were purchased from cooperators:

1,685 strips containing 528 acres.

Planted by Commission personnel—115 strips containing 124 acres.

5. Wildlife Borders—On many farms in the better agricultural areas the only available areas for wildlife habitat improvement are farm woodlots. On such areas Commission personnel established the following wildlife borders:

Cut .....	184,483 linear ft. 25 feet wide
Planted to shrubs .....	13,900 " " " "
Seeded to lespedeza .....	52,100 " " " "

6. Farm Ponds—Technical assistance and advice was furnished on the following farm pond sites:

Investigated .....	241
Recommended .....	217
Completed .....	142

7. Drainage of suitable areas on poorly drained soils provides additional wildlife nesting sites and 997 acres were thus improved by 49,411 linear feet of carefully planned drainage.

8. Pasture Improvement—Cooperators were aided in improving 1,895 acres. This practice provides improved food, cover and nesting sites for rabbits.

9. Diversion Ditches Surveyed—31,535 linear feet improved 409 acres.

10. Woodland Management—Furnishing management advice on 1,932 acres.

11. Materials Distributed to Cooperators—Crow repellent 7,744 pints. This item aided materially in preventing crow, blackbird and pheasant damage to corn.

Rye Grass Seed—151,007 pounds. This item was furnished to cooperators for planting in contoured strips planted to corn. Many cooperators have been provided with this item for a full rotation of crops, therefore, future requirements will decrease.

12. Other Practices—Seven acres of wild crab apple were improved by release cutting.

#### *Game Stocked*

The following wildlife was released on project areas:

Rabbits 24,414—Pheasants 117,300—Quail 6,423—Turkeys 237

Squirrels 134—Ducks 24—Total of 148,532 pieces.

#### *Game Killed*

Rabbits 366,599—Pheasants 180,378—Quail 2,021—Squirrels 92,262

Woodchucks 62,396—Grouse 7,789—Woodcocks 2,740—Raccoons 19,069

Deer 3,433—Waterfowl 5,042—Turkeys 64—Doves 252.

A total of 742,045 pieces

#### *Predators Removed*

Red Foxes 2,483—Grey Foxes 3,292—Weasels 1,513—Opossums 5,047

Hawks 1,078—Owls 362—Stray cats, crows, etc. 5,967.

Grand total 19,742

#### *Number of Hunters Using Projects and Man Days Hunted*

Number of hunters .....	379,413
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Man Days hunted .....	763,933
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#### *Hunting Accidents*

A total of 18 hunting accidents, all non-fatal, occurred on project areas.

### **FOOD AND COVER SECTION**

Annual maintenance on all owned and leased lands, with the exception of Cooperative Farm-Game Projects, included over 3,600 miles of boundary line, 977 miles of roads, 618 miles of fire trails, and refuges and special areas totaling over 168,000 acres. Continual upkeep is essential on all lands if proper respect by the public is to be expected.

Seventy miles of earth roads were built on Game Lands to provide access to food strips, and 10 miles of fire trails to increase protection in forested areas. In addition, 14 storage sheds and 19 corn cribs were constructed to store farming equipment and various grains harvested.

Under the Rabbit Farm Program approved by the Commission in 1950, 288 individual farms, totaling 31,540 acres were established and provisions made to develop the areas. This program is effective in 14 counties and provides for the establishment and management of one farm in each township of the 14 counties for the natural propagation of rabbits with the consent of the farmers concerned. These farms are closed to hunting and the



Photo by Joseph S. Chick.

*Many strips of corn were planted, some of them adjacent to stands of evergreens to provide additional food for wildlife.*

landowner may trap the surplus animals on his farm in traps furnished by the Commission. He receives \$1.00 for each animal in payment for this service; otherwise the rabbits are removed by game officials for restocking elsewhere.

#### *Management of Food Strips and Open Field Areas*

An expanded food and cover budget paved the way for an intensified management program which included the clearing of 1,365 acres of forest area or reverting fields, planting 4,230 strips of corn and small grains totaling 6,980 acres, and the seeding of an additional 2,000 acres of grasses and clovers to improve habitat for both forest and farm-game species.

Grazing and nesting sites on old field areas were improved by mowing 1,320 acres, fertilizing 1,180 and liming over 2,560 thus greatly benefiting the game management areas.

Share-crop farming on State Game Lands was encouraged. More than 4,360 acres were planted by adjoining farmers, the Commission's share amounting to 13,800 bushels of harvested grain and over 130 acres of standing grains. Fields handled in this manner were maintained under proper crop rotations, thus reducing the management costs to the Commission.

Soil conservation practices, including contour planting, strip cropping diversion ditches, bedding of fields, sod waterways, and seeding of woodland borders were applied to 1,360 acres of farm land. Fields so managed provided demonstration areas and at the same time conserved soil and water on these lands.

Purchase of food strips on private lands provided supplemental food for wildlife on farms open to public hunting. Under this program 1,395 separate grain or clover strips totaling over 630 acres were obtained, greatly improving areas previously stocked by the Commission.

### *Timber Sales and Forest Cuttings*

The sale of forest products improved game habitat on over 8,000 acres of State Game Lands. This operation provided a cash return of \$91,748.14. Products removed included 2,522,300 board feet of saw timber, 32,525 tons of mine timbers, 8,460 cords of paper and chemical wood, 335,685 posts and props and 214 cords of firewood. Harvesting timber on a selective basis is the most economical method of managing food and cover for forest game species.

An additional 3,835 acres of forest area were improved for wildlife through other types of cutting. Treatment included release cuttings, thinning timber stands, small slashings to provide cover, releasing and pruning fruit trees, and pushing over inferior second growth on unproductive timber areas with bulldozers. It is estimated that wildlife on an additional 15,000 surrounding acres benefited from these cuttings.

Woodland border release cuttings were given emphasis during the past two years. Large trees along field edges were cut and the brush piled to provide cover. Removal of these trees for an average width of 35 feet along 286,000 linear feet of woodland border provided additional food and cover for wildlife. Immediate results have been observed in the increased growth of berry producing shrubs and vines.

### *Seedlings and Transplants*

More than 3,509,000 tree, shrub and vine seedlings were planted to improve food and cover for wildlife on approximately 4,000 acres of State Game Lands and leased areas.

Eleven small nurseries located on State Game Lands provided 504,000 multiflora rose, 21,450 Asiatic chestnut, and 36,350 miscellaneous shrub seedlings. These were utilized in the food and cover and cooperative farm-game programs. Additional seedlings required in the planting schedule were purchased from state agencies and commercial nurseries.

Over 550 highbush huckleberry plants were transplanted from State Game Lands to swamps on the Allegheny National Forest. Since previous plantings showed good survival, additional stock was planted to provide supplemental food for wildlife on these areas.

### *Waterfowl Management*

Over 325 acres of waterfowl feeding grounds were improved by planting smartweed, wild duck millet, burreed, duckmeats, wild celery, wampee, duck potatoes, wild rice and three square rush. Many additional surrounding areas were improved by this practice.

The construction of one dam of 120 acres on State Game Lands No. 183, two small ponds on State Game Lands No. 118 and No. 213, and three ponds on the Allegheny National Forest, increased the water acreage for waterfowl by 123.5 acres. Plantings along these shorelines will improve the area for waterfowl.

Resting areas for breeding waterfowl were improved by dynamiting 10,300 linear feet of ditches 10' wide in marsh areas. Properly located, these water areas will increase the habitat and potential waterfowl population in Pennsylvania.

Over 1,550 wood duck nesting boxes were constructed and erected along streams and ponds. Field observations indicate that better than 50% of these boxes are utilized the first year.

### *State Game Lands No. 219—Former Federal Resettlement Lands*

Former Federal Resettlement Lands, totaling 5,134.64 acres located in Northeast Bradford County, were leased to the Commission to be managed in cooperation with the United States Forest Service.

Plans to manage 2,500 acres of open field acres through sale of grazing rights, and to improve game food and cover on the remaining area by seasonal plantings and forest edge cuttings, were approved by the United States Forest Service.

During the brief period these lands have been under Commission management, personnel have improved the pastures by mowing 650 acres, liming 150 acres, fertilizing 105 acres and improving the fence around 1,800 acres.

Development work included the planting of 85,000 evergreens, 100,000 miscellaneous shrubs and 231,000 multiflora rose to increase the available winter cover and provide living fences and travel lanes for game on areas being managed exclusively for wildlife. In addition, game cover along 8,200 linear feet of woodland borders was improved by cutting the larger trees for a width of 30 feet along the adjoining fields. Supplemental grains were made available to wildlife by planting 25 acres of food strips. Fifty apple trees were pruned to increase the fruiting capacity.

### *Game Management License—Loyalhanna Reservoir*

A Game Management License was executed July 9, 1951, between the United States Government and the Commission, granting the latter the right to manage wildlife on certain portions of the Loyalhanna Flood Control Reservoir area in Westmoreland County. No actual wildlife development work was started, but plans are being prepared to conduct various plantings and cuttings at locations to be approved by the local project engineer.

### *Federal Air Projects*

The Federal Aid in Wildlife Act provides that the United States Government will finance seventy-five percent of approved wildlife management projects.

Projects administered by the Food and Cover Section were as follows:

#### *"Cover Type and Soils Mapping of State Game Lands"*

This project was reduced to basic mapping and planning work. Survey of land uses and cover conditions of four State Game Lands were completed and a partial survey made on approximately 30,000 acres of State Game Lands No. 13, Sullivan County. The latter was discontinued due to lack of personnel.

Aerial photographs or topographic maps were processed for subsequent map construction or survey uses. Base maps of 32 State Game Lands were revised or drafted. Photomaps of 22 State Game Lands were enlarged.

Recommendations for food and cover on five State Game Lands were prepared until July 1, 1951, at which time this project was discontinued. The leader was transferred to the "Food and Cover and Farm Game Development" project, where he assists in base mapping and preparation of management recommendations.

#### *"Forest Wildlife Development"*

This project was approved to improve wildlife habitat through selective forest cuttings and thinnings on State Game Lands No. 25, Elk County. Personnel treated over 200 acres and sold over 92,000 board feet of sawlog, 1,330 cords of paperwood and 760 cords of chemical wood. An income of \$39,278.31 derived from these sales was returned to the Game Fund and

designated for future use in conducting similar cuttings.

Since October 1, 1950, this project has been financed entirely by the Game Commission, utilizing funds that accumulated from previous timber sales. Reports of progress are received and relayed to the Federal Government as part of the Consolidated project, "Food and Cover and Farm Game Project Development."

#### *"Coordination Project"*

This project was discontinued October 31, 1950 when it became a part of Food and Cover and Farm Game Project Development.

#### *"Food and Cover and Farm Game Project Development"*

On July 1, 1951, all projects operating under the Land Utilization Division were consolidated under one project. Development of Cooperative Farm Game Projects will be reported under the Farm Game Cooperative Section. All food and cover activities, summarized elsewhere in this report, were partially financed by funds provided under the Federal Aid in Wildlife Act, and are credited to this project.

#### *Winter Feeding and Miscellaneous*

Due to severe winter weather it was necessary to feed large amounts of harvested grain to prevent wildlife from starving. Over 75,400 bushels of corn and other grains were placed in feeders by Commission employees. An additional 28,800 bushels were distributed to Sportsmen's Clubs, Boy Scouts, etc., for use in local feeding programs.

Miscellaneous activities included building of game feeders and shelters for wildlife, and backboards for use in posting refuges and other areas. Field personnel helped suppress 30 forest fires which burned 11,300 acres of State Game Lands, 2,100 acres of State Forests, and 8,200 acres of private forests. Close cooperation was maintained with other State and Federal Conservation Agencies.



Photo by Ralph Cody.

*Management practices include improved environment for the valuable muskrat.*

## Wildlife Protection Division

A vigorous program, aimed primarily at the wilful and malicious violator was pursued during the past two years. Much more stress was placed upon the apprehension of major offenders and the prosecution of any cases that might be classed as technical and subject to criticism was avoided as much as possible in a sincere public relations effort.

While the total number of violators apprehended is less than in the prior biennium, improved law enforcement is reflected by an appreciable increase in the number of license revocations. Such concentration on cases of a more serious nature, which resulted in the loss of hunting and trapping privileges, is bound to curb lawlessness and indifference as the record clearly shows.

Of the total apprehensions made 97% resulted in convictions, indicating capable investigation and careful preparation of prosecutions instituted.

### TEN-YEAR SUMMARY

<i>Fiscal Year</i>	<i>Number of Prosecutions</i>	<i>Penalties Collected</i>
1942-1943 .....	2,501	\$ 50,441.55
1943-1944 .....	2,669	68,524.50
1944-1945 .....	1,831	51,687.65
1945-1946 .....	2,168	63,188.00
1946-1947 .....	4,030	136,697.75
1947-1948 .....	4,251	130,055.75
1948-1949 .....	4,825	148,925.80
1949-1950 .....	6,107	200,888.35
1950-1951 .....	4,249	136,844.21
1951-1952 .....	4,628	146,497.25

### HUNTING LICENSE REVOCATIONS

Continuing a Commission policy of long standing, hunting and trapping privileges were suspended in addition to the cash penalty imposed in convicted cases of a major character. Such revocations are based upon consideration of the severity of the offense, and may extend from one to ten years.

Hunter's licenses revoked in 1950-1951 .....	2,000
Hunter's licenses revoked in 1951-1952 .....	767

### REFEREES' HEARINGS

Hunters or trappers who wound themselves or another by gunfire or bow and arrow through carelessness or negligence, or who commit acts of vandalism or assault upon a landowner, are likely to lose their licenses too. Such revocations are effected through a referee's hearing held in accordance with the Game Code. The numbers were as follows:

1950-1951—Number of Hearings .....	199
Hunting Rights denied by hearings .....	127
Defendants discharged .....	72
1951-1952—Number of Hearings .....	132
Hunting Rights denied by hearings .....	101
Defendants discharged .....	31

## LICENSE REVOCATIONS BY COURT OF QUARTER SESSIONS

Some hunters had their licenses revoked by the various Courts of Quarter Sessions for shooting at, wounding or killing a human being in mistake for game:

<i>Year</i>	<i>No. of Revocations</i>
1950-1951 .....	9
1951-1952 .....	9

## DEER KILLED TO PROTECT PROPERTY

In most sections of the State the deer population is still so large that many persons find it necessary to exercise their prerogative under the law and kill the animals which materially damage cultivated crops, commercial nurseries and fruit orchards.

<i>Year</i>	<i>Number Reported Killed</i>
1950-1951 .....	2,065 deer reported killed in 47 counties
1951-1952 .....	2,142 deer reported killed in 44 counties

## SPECIAL PERMITS

The Game Law provides the Commission may issue Special Permits to qualified persons for the operation of certain concessions relative to wild birds and animals. The number and kind of such special permits is set forth below:

### ISSUED DURING

<i>Kind of Permit</i>	<i>1950-51</i>	<i>1951-52</i>
Archery .....	72	....
Collecting .....	23	25 (6 others gratis)
Dog Training .....	195	200
Ferrett Breeder .....	2	2 (3 others gratis)
Field Trial .....	175	109
Fox Hunting .....	23	23
Fur Dealer's .....	290	317
Fur Dealer's Employe's .....	11	23
Fur Dealer's Nonresident .....	9	19
Fur Farming .....	372	344
Game Propagating .....	323	333
Regulated Shooting Grounds ....	48	53
Retriever Trials .....	3	3
Roadside Menageries .....	32	38
Taxidermy .....	126	124

<i>Year</i>	<i>Permits Issued</i>	<i>Cash Collected</i>
1950-1951 .....	1,708	\$17,594.00
1951-1952 .....	1,618	\$18,690.00
(9 others gratis) .....	9	
	—	
	1,627	

## BEAR DAMAGE

Roving bears occasionally kill livestock and poultry and damage some bee-hives every year. The Game Fund contains an annual ear-marked fund of \$5,000 for paying such claims.

Year	County	Claims	Calf	Sheep	Hives	Hogs	Chickens & Chicks	Domestic Rabbits	Amount Paid
1950-1951	Blair . .	1	..	..	..	..	6	..	\$15.00
1951-1952	Blair . .	..	..	..	..	..	..	..	
1950-1951	Centre . .	2	..	..	..	2	38	4	104.05
1951-1952	Centre . .	2	..	..	4	..	..	..	31.10
1950-1951	Clarion . .	2	..	..	3	..	..	..	36.00
1951-1952	Clarion . .	2	..	..	7	..	..	..	75.00
1950-1951	Clearfield . .	4	..	..	28	..	..	..	258.28
1951-1952	Clearfield . .	1	..	..	4	..	..	..	35.50
1950-1951	Clinton . .	..	..	..	..	..	..	..	..
1951-1952	Clinton . .	1	..	1	..	..	..	..	30.00
1950-1951	Elk . . . .	2	..	..	6	..	..	..	70.15
1951-1952	Elk . . . .	3	1	..	2	..	..	..	57.00
1950-1951	Jefferson . .	3	..	..	3	2	..	..	85.00
1951-1952	Jefferson . .	3	..	..	4	..	..	..	57.00
1950-1951	Luzerne . .	1	..	..	1	..	..	..	9.00
1951-1952	Luzerne . .	2	..	..	5	..	..	..	48.00
1950-1951	Lycoming . .	2	..	..	1	..	6	..	25.00
1951-1952	Lycoming . .	1	..	..	4	..	..	..	48.00
1950-1951	McKean . .	6	..	..	7	..	..	..	51.50
1951-1952	McKean . .	4	..	..	7	..	..	..	83.76
1950-1951	Monroe . .	..	..	..	..	..	..	..	..
1951-1952	Monroe . .	4	..	..	16	..	..	..	267.00
1950-1951	Potter . .	7	..	7	1	..	..	..	151.22
1951-1952	Potter . .	11	..	9	14	..	..	..	512.02
1950-1951	Tioga . .	3	..	..	7	..	..	..	80.00
1951-1952	Tioga . .	5	..	..	12	..	..	..	175.00
1950-1951	Union . .	1	..	..	10	..	..	..	63.45
1951-1952	Union . .	..	..	..	..	..	..	..	..
1950-1951	Warren . .	..	..	..	..	..	..	..	..
1951-1952	Warren . .	1	..	..	5	..	..	..	113.25
Totals 1950-1951 . .	34	..	7	67	4	50	4	\$ 984.65	
Totals 1951-1952 . .	40	1	10	84	..	..	..	\$1532.65	

Photo by Ralph Cady.

Too many cub bears are killed every year but alert Game Protectors are curbing these violations through their extensive car searching programs.



## TAXIDERMY EXAMINATION

Since 1937 the Commission has tried to improve the quality of taxidermy work by holding examinations for applicants for such licenses by a Taxidermy Board. During the past two years examinations were conducted and applicants approved as listed:

<i>Year</i>	<i>Successful Applicants</i>
1950-1951 .....	9
1951-1952 .....	3

## NEW EQUIPMENT FOR FIELD OFFICERS

Serviceable coveralls to conserve more expensive uniform equipment when in fatigue duty were furnished.

Each officer was provided with suitable dress shoes to wear with his uniform.

Eighty-four sets of Sam Brown belts and holsters were supplied to replace worn out equipment and to equip new officers.

Forty-eight dozen new fox traps were supplied to conduct predator control work and alleviate damage problems.

Fifty pairs of snowshoes were furnished for winter work in back country during heavy snows.

Twenty-eight new live beaver traps were acquired to relieve damage from these animals and to trap and transfer them from one locality to another.

## PREDATOR CONTROL

### *abies Control in Wildlife*

Due to an epidemic of rabies in wildlife, especially foxes, during 1951 in northeastern and Southeastern Pennsylvania and certain smaller areas in northwestern Pennsylvania, a campaign was inaugurated early in 1952 to prevent further inroads of this dread infection. Humans attacked by rabid foxes became almost a daily occurrence and the loss to dairy cattle and her domestic livestock reached alarming proportions.

The program called for drastic measures never before attempted in the field of wildlife management. Several meetings were held with representatives from the Department of Agriculture and Health and the course of action agreed upon by the Department of Justice was presented to and received the endorsement of Governor Fine.

It was agreed that the most effective immediate results would be obtained by using poison. Control by trapping proved to be too slow to be effective over a large area. Pennsylvania and other states previously employed professional trappers for this purpose and the method was found wanting.

The campaign was launched during the denning season and got underway on February 27 in the Southeast Division and followed shortly thereafter in the Northeast and Northwest Divisions. Approximately 175 regularly employed Commission personnel participated. Two experienced predator control agents from the U. S. Fish and Wildlife Service also assisted in promoting the campaign.

At the outset heavy snows and bad weather hampered the work, especially in the Northeast Division. Nevertheless, the entire area was treated by early May. Counties or parts of counties treated during the campaign included: Northwest—Venango and Butler. Northeast—Bradford, Sullivan, Lycoming, Columbia, Luzerne, Monroe, Pike, Wyoming, Lackawanna, Susquehanna and Wayne. Southeast—York, Lebanon, Berks, Lehigh, Bucks, Montgomery, Lancaster, Chester and Delaware.



Photo by D. L. Batcheler

A Game Protector posts the first public warning against the rabies epidemic which was so prevalent in certain parts of the state during 1952.

The proposed campaign was greeted with considerable skepticism from me quarters, but as the program advanced it was found to be more effective than anticipated. The large number of foxes, skunks and opossums in the affected areas was reduced to a minimum, and the number of positive bies cases in these areas has been almost nil since the project ended.

Some persons protested the use of poison so violently and questioned the gal right to apply this method that arrest warrants were served on Thos. Frye, the Executive Director of the Commission, on April 18, 1952, and Game Protectors Edwin W. Flexer, Quakertown, Bucks County and Donald L. Croft, Horsham, Montgomery County on April 8, 1952.

Although these proceedings were embarrassing to all concerned, they had a happy ending when President Judge Hiram H. Keller of the Court of Quarter Sessions handed down an opinion of "not guilty." The able prosecution of the case for the Commonwealth by Deputy Attorneys General Albert I. Lehrman and David S. Kohn is worthy of citation in this important event which attracted national attention.

#### bounties

The Commission discontinued the bounty on the red fox on August 1, 1949. However it was restored on June 1, 1951 when these animals began to increase due to an extreme low market value on long-haired furbearers. Trappers just wouldn't brother with them and their lack of interest resulted in a much smaller kill of these predators.

#### **BOUNTIES FOR PERIOD FROM JUNE 1, 1950 TO AND INCLUDING MAY 31, 1951**

1. Weasel—\$1.00 for each weasel.
2. Gray Fox—\$4.00 for each gray fox, except in Chester and Delaware Counties.
3. Goshawks—\$5.00 for each adult goshawk, and \$3.50 for each fledgling which had not left the nest.
4. Great-horned Owls—\$5.00 for each adult great-horned owl or fledgling, each fledgling which had not left the nest.

#### **BOUNTIES FOR PERIOD FROM JUNE 1, 1951 TO AND INCLUDING MAY 31, 1952**

1. Weasel—\$1.00 for each weasel.
2. Gray Fox—\$4.00 for each gray fox.
3. Red Fox—\$4.00 for each red fox.
4. Great-horned Owls—\$5.00 for each adult great-horned owl or fledgling.

#### **BOUNTIES PAID FROM JUNE 1, 1950 to MAY 31, 1951**

Total Claims .....	10,328
Weasels .....	8,207
Gray Foxes .....	14,296
Goshawks .....	32
Great-horned Owls .....	1,477
Total amount expended .....	\$72,728.50

There were 139 claims forwarded to the Division Supervisors to be investigated for possible fraud which resulted in the collection of \$1,225.00 in claims. Claims were disapproved for the killing of 192 weasels and 215 gray foxes, thereby refusing payment of \$1,052.00.

A bounty also was refused for the killing of 89 weasels, 140 gray foxes and 25 great-horned owls because the claims were outdated by the four month's provision of the Game Law or improperly presented.



Photo by Hal Harrison.

*Under normal conditions Pennsylvania's fur harvest pays trappers annual dividends in excess of a million dollars.*

#### BOUNTIES PAID FROM JUNE 1, 1951 TO MAY 31, 1952

Total claims .....	18,830
Weasels .....	12,540
Gray Foxes .....	24,764
Red Foxes .....	26,462
Great-horned Owls .....	1,714
Total Amount Expended .....	\$226,014.00

Of 221 claims forwarded to the Division Supervisors for investigation 17 claimants were prosecuted and \$1,350.00 in fines collected. Claims were disapproved for the killing of 143 weasels, 205 gray foxes and 191 red foxes thereby refusing payment of \$1,727.00.

Bounty was disallowed for the killing of 100 weasels, 205 gray foxes, 10 red foxes and 30 great-horned owls because the claims were outdated by the four month's provision of the Game Law or improperly presented.

#### FURBEARERS

For some years the market for long-haired furbearers has been very low and it did not pay trappers to harvest the crop. Consequently the populations of raccoons, skunks and opossums increased tremendously thereby still further depreciating the market value of these animals and further discouraging their control.

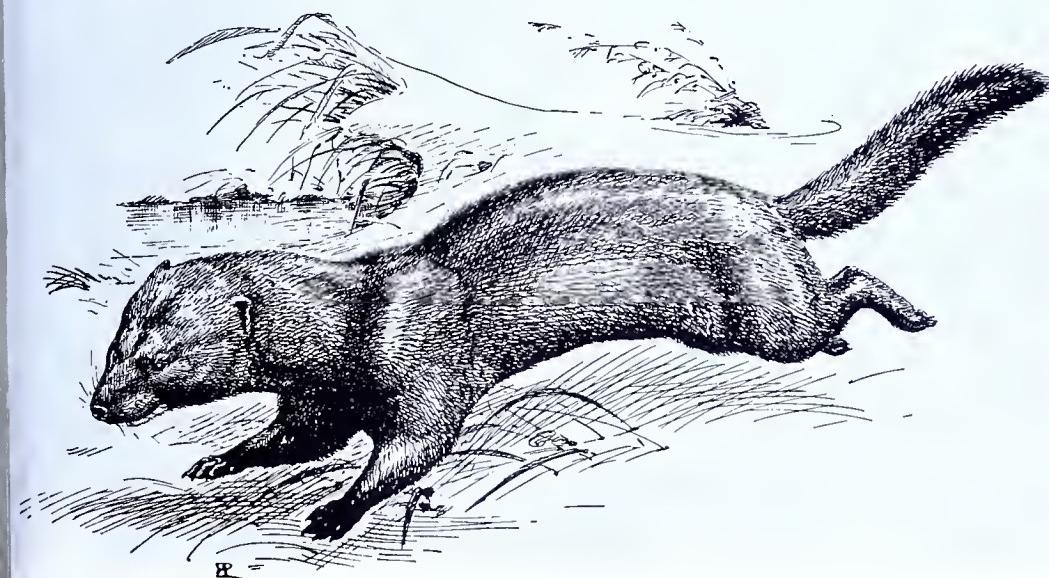
Muskrats, minks and beavers, which are the short-haired species, have maintained a satisfactory market although it was a little less over all than during the previous biennium.

## RAW FURS SOLD DURING THE SEASON OF 1949-1950

<i>pecies</i>	No. of Pelts	Total Value
Muskrats	522,044	\$766,480.08
kunks	52,351	35,768.24
Minks	8,389	126,953.14
Opossums	46,863	10,296.11
Beavers	2,777	44,460.00
Otters	1	12.00
Raccoons	40,288	29,959.22
Weasels	26,171	27,444.35
Red Foxes	2,608	1,050.85
Gray Foxes	5,844	949.66
Wild Cats		
Totals	707,336	\$1,043,373.65

## RAW FURS SOLD DURING THE SEASON OF 1950-1951

<i>pecies</i>	No. of Pelts	Total Value
Muskrats	2,154	\$ 4,612.65
kunks	38,158	44,649.01
Minks	5,087	98,944.00
Opossums	27,684	8,406.20
Beavers	3,218	76,004.49
Otters	5	82.00
Raccoons	34,575	55,874.50
Weasels	11,294	17,814.09
Red Foxes	2,591	1,596.80
Gray Foxes	6,663	2,005.99
Wild Cats	7	1.65
Totals	131,436	\$309,991.29



## Game Propagation Division

### GAME FARM OPERATIONS

The two ringneck pheasant farms and the wild turkey farm operate at full capacity, the day-old pheasant chick program was greatly expanded and the fall purchases of ringnecks from Pennsylvania breeders were increased.

Quail production was again held at about 10,000 birds a year and efforts were made to produce birds that are better able to survive in the wild state.

The 21 wild turkey areas were utilized, both for restocking and egg collecting, to maintain the wildness of the strain. To the person who reads one of these reports for the first time a further explanation of a wild turkey area will be helpful. They are areas of ideal natural habitat into which farm reared birds having a high degree of wild strain can attract wild toms. Mating takes place, eggs are laid and subsequently collected and hatched out in large incubators at the State wild turkey farm. Second clutches are not collected and mother turkey raises this brood herself.

Too much cannot be said about the efforts to restock these wily birds. They have been liberated in much of their former north central range and in the several years since this program has been underway they have reproduced their number amazingly. The turkey will long live in Pennsylvania under this carefully developed long range program.



Photo by Bryant Tyrrel.

*Efforts are being made to produce quail that are better able to survive in the wild.*



Photo by D. L. Batcheler.

*More than 6,000 mallard ducklings were purchased and raised at State Game Lands o. 213, Crawford County and liberated throughout the Commonwealth in an effort to increase the wild waterfowl population.*

### STATE GAME FARM PRODUCTION RECORD

#### *Ringneck Pheasants:*

	Calendar 1950	Years 1951
Total number of eggs produced .....	403,726	476,829
Total number of eggs shipped to sportsmen .....	10,960	86
Total number of day-old chicks shipped to sportsmen .....	166,155	224,901
Total number of 12-20 week old birds shipped for release .....	25,771	20,470
Total number of mature birds shipped for release .....	37,606	49,883

#### *White Quail:*

Total number of eggs produced .....	40,109	35,731
Total number of eggs shipped to sportsmen .....	3,470	3,595
Total number of day-old chicks shipped to sportsmen .....	1,395	2,496
Total number of six-week old birds shipped to sportsmen .....	116	720
Total number of 12-18 week old birds shipped for release .....	4,970	4,945
Total number of mature birds shipped for release .....	3,304	5,556

#### *Wild Turkeys:*

Total number of eggs produced (farm) .....	11,820	14,271
Total number of 12-week old birds shipped for release .....	2,519	2,555
Total number of mature birds shipped for release .....	1,806	2,719

### GAME PURCHASES

The Commission discontinued spring purchases of pheasants in 1951, but this was offset by the increased winter holding of hens raised by farm-game operators and those purchased from commercial breeders during September. All purchases are confined entirely to breeders located within the Commonwealth.

## GAME PURCHASES 1950-1952

Spring purchases were discontinued in 1951

	<i>Number 1950-51</i>	<i>Cost</i>	<i>Avg. Cost</i>	<i>Number 1951-52</i>	<i>Cost</i>	<i>Avg. Cost</i>
Rabbits .....	18,140	\$21,405.20	\$1.18	.....	.....	.....
Ringneck Pheasants (Fall 1950) .....	35,466	67,116.05	1.89			
(Spring 1951) ...	17,430	52,559.52	3.02	50,459	\$96,441.85	\$1.9
Mallard Duckling ..	1,625	568.75	.35	6,200	2,420.00	.3
Canadian Geese ...	.....	.....	.....	24	120.00	5.0

## LIVE TRAPPING AND TRANSFER OF WILD GAME

The transfer of rabbits from closed hunting acres to lands open to public hunting hit a new high during the winter of 1950-51, and this record was surpassed the following winter.

Rabbit farms were established in six additional counties: Indiana, Buck Columbia, Perry, Butler and Clearfield. At the present time 286 farms with a total of 31,540 acres, are being utilized to increase the rabbit transfer program.

## WILD GAME TRAPPED AND TRANSFERRED

	<i>Fiscal Year 1950-1951</i>	<i>Fiscal Year 1951-1952</i>
Cottontail Rabbits .....	57,789	57,991
Ringneck Pheasants .....	384	341
Gray Squirrels .....	252	14
Raccoons .....	49	32

## TOTAL GAME RELEASED 1950-1951

	<i>From Game Farms</i>	<i>Pur- chases</i>	<i>Trapped &amp; trans- ferred</i>	<i>Farm- Game Co- operators</i>	<i>Total</i>
Cottontail Rabbits .....	.....	18,140	57,789	.....	75,9
Ringneck Pheasants .....	70,519	52,896	384	64,855	188,6
Bobwhite Quail .....	10,171	.....	.....	.....	10,1
Wild Ducks .....	.....	2,731	.....	.....	2,3
Wild Turkeys .....	5,223	.....	.....	.....	5,2
Gray Squirrels .....	.....	.....	252	.....	2
Raccoons .....	.....	.....	49	.....	49

## TOTAL GAME RELEASED 1951-1952

	<i>From Game Farms</i>	<i>Pur- chases</i>	<i>Trapped &amp; trans- ferred</i>	<i>Farm- Game Co- operators</i>	<i>Total</i>
Cottontail Rabbits .....	.....	.....	57,991	.....	57,9
Ringneck Pheasants .....	60,036	48,192	341	124,432	233,1
Bobwhite Quail .....	13,247	.....	.....	.....	13,2
Wild Ducks .....	.....	4,966	.....	.....	4,9
Wild Turkeys .....	5,175	.....	.....	.....	5,1
Gray Squirrels .....	.....	.....	14	.....	14
Raccoons .....	.....	.....	32	.....	32

## WILD DUCK PROPAGATION

During 1951, 6182 mallard ducks, 5 to 7 weeks of age, were banded and operated. Reports were received on 695 bands or 11.2% which is considered very good. Fifty-two bands were returned from other states and Canada, as stated below:

New York .....	19
Ontario, Canada .....	11
Michigan .....	7
Maryland .....	4
North Carolina .....	3
Quebec, Canada .....	2
Ohio .....	2
Connecticut .....	1
Delaware .....	1
New Jersey .....	1
Tennessee .....	1

The ducklings were purchased and raised at State Game Lands 213, Crawford County, and liberated throughout the state.

## PHEASANT HOLDING

To increase the spring stocking of ringnecks, pheasant holding pens have been placed on game lands in the following counties: Lebanon, Susquehanna, Westmoreland, Clarion, Erie, Crawford and Juniata. Hens raised to 12 weeks of age by farm-game cooperators and part of those hens purchased from commercial breeders are placed in these pens in the fall and held for March release. Through this program, a greater breeding stock is available for propagation in a wild state, thus resulting in increased numbers of ring-neck pheasants.

## TURKEY HARDENING PENS

To increase the wildness of young turkey toms liberated prior to the hunting season, two open top pens of approximately 40 acres have been constructed. One is located in Cameron County and the other in Blair County. Young toms from the game farm are placed in these pens for a hardening period of six to eight weeks and then are released throughout central Pennsylvania. Reports indicate that these pens are a great help in acclimating these young toms.

## DAY-OLD PHEASANT CHICK PROGRAM

The day-old pheasant chick program was greatly expanded over the preceding two-year period, 166,155 in 1950 and 224,901 in 1951 having been shipped from the game farms to interested sportsmen, farm-game cooperators, rabbit farm cooperators and farmers whose lands are open to public hunting.

Approximately 78% of these birds were raised to twelve weeks of age or older in 1950 and 80% in 1951 and released on open hunting areas. This is the highest record attained to date by those cooperating in this program.

From all sources, a total of 542,216 pheasants were released—the highest number ever liberated by the Commission.

**TABLE NO. 1**  
**SUMMARIZED FUNCTIONAL EXPENDITURES**

The expenditures of the Commission during the biennium ending May 31, 1952 have been subdivided into major activity groupings as follows:

	Part of Dollars
Utilization of Land for Wildlife Management of State Game Lands, Cooperative Farm-Game Projects and other leased areas totaling 2,058,212 acres. Also payments in lieu of taxes .....	\$3,161,011.32      38½
Propagation of Game. Operation of game farms, purchase of game, wild game transfer, distribution of game .....	2,116,711.68      25½
Protection of Wildlife. Salaries and expenses for enforcement of game laws, assistance in enforcement of fish, dog and forest laws and numerous other field activities .....	1,495,616.77      18
Conservation Education. Game News, publications, exhibits, motion pictures, radio broadcasts, attending Sportsmen's meetings, etc. . .	515,823.42      6¼
Bounty Payments. Bounties on noxious animals including administrative expenses relating thereto .....	334,797.06      4
Wildlife Research. Wildlife studies to determine practical methods for developing management programs .....	140,321.46      1¾
Instruction and Training. Refresher course and instruction for all salaried field employes and some Deputy Game Proectors; School maintenance and expenses in connection with 6th class of Student Officers enrolled May 1, 1950 and graduated April 28, 1951 and the enrollment on May 25, 1952 of the 7th class of Student Officers .....	121,232.02      1½
Executive Officer. Accounting and Office Service (\$391,886.09 subdivided below):	
Accounting and Office Service. Audit of accounts and bookkeeping, personnel matters; supervision over purchases, equipment and supplies .....	191,003.81      2½
Hunting Licenses. Including tags, applications, reports .....	132,184.74      1¾
Executive Office. Administration, Salaries and expenses of Executive Office and expenses of Commissioners .....	68,697.54      ¾
Totals .....	<hr/> \$8,277,399.82      100

# HOW THE GAME FUND DOLLAR WAS USED

THESE FUNCTIONAL EXPENDITURES COVER THE PERIOD JUNE 1, 1950 TO MAY 31, 1952

THE EXPENDITURES INDICATED FOR EACH MAJOR ACTIVITY INCLUDE ALL ADMINISTRATIVE EXPENSES IN CONNECTION THEREWITH

PROPAGATION OF GAME

$25\frac{1}{2}\text{¢}$

PROTECTION OF WILDLIFE

$18\text{¢}$

UTILIZATION OF LAND FOR WILDLIFE

$38\frac{1}{4}\text{¢}$

CONSERVATION EDUCATION  
 $6\frac{1}{4}\text{¢}$

BOUNTY PAYMENTS -  $4\text{¢}$   
WILDLIFE RESEARCH -  $1\frac{3}{4}\text{¢}$

GENERAL OFFICE ADMINISTRATION -  $3\frac{1}{4}\text{¢}$   
HUNTING LICENSES -  $1\frac{3}{4}\text{¢}$   
HUNTING AND OFFICE SERVICE -  $2\frac{1}{4}\text{¢}$

INSTRUCTION AND TRAINING -----  $1\frac{1}{2}\text{¢}$

**TABLE No. 2. PENNSYLVANIA GAME COMMISSION STATEMENT OF REVENUE, EXPENDITURES AND CASH BALANCES—FISCAL YEAR JUNE 1, 1950  
TO MAY 31, 1951**

REVENUE	
Cash in State Treasury to credit of "Gazelle Fund" June 1, 1950	\$1,722,982.94
Receipts June 1, 1950 to May 31, 1951:	
Hunters' Licenses (after deducting the Issuing Agents' Commission) .....	\$2,915,481.49
Game Laws Fines .....	138,481.52
Special Game Permits (Fur Dealers, Taxidermists, Game Propagators, etc.) .....	17,564.00
Interest on Deposits .....	15,145.36
Sale of Forest Products from Game Lands .....	42,749.59
Sale of Animal Skins .....	13,413.45
Sale of Unserviceable Property and Equipment .....	3,759.80
Rentals from Buildings and Land .....	77,467.93
Sale of Publications .....	33,678.12
Federal Aid for Wildlife Purpose; (75% of cost of approved projects) .....	518,477.98
Miscellaneous Items .....	20,513.79
Total Receipts from All Sources .....	3,796,733.03
Total Funds Available during Year .....	\$5,519,715.97

## CLASSIFICATION OF EXPENDITURES BY ORGANIZATIONAL UNITS

Feed (for Game Farms and game in the wild) .....	10.45	195,612.09	11.63	33,006.78	1,318.69	23.97	11.22	356.02	228,618.87
Express and Cartage .....		886.92		2,457.23					5,076.13
Purchase of Lands (title and survey included) .....		9,448.47		42,972.85					52,421.32
Payments in Lieu of Taxes to Local Taxing Units .....		210.09		66,363.79					66,573.88
Building and Construction (mostly on Game Farms) .....		129,429.42		14,097.00					143,954.68
Repairs to Buildings, Grounds and Equipment by Contract .....	69.50	677.58		2,935.34	93.71			1,066.00	251.31
Equipment (mostly for land manage- ment and Game Farms) .....	6,305.54	13,058.63	1,351.50	84,979.33	373.27	33.00	210.59	4,751.49	109,711.85
Miscellaneous Supplies .....	2,418.04	44,664.34		191,895.00	10,566.25	100.88	11,216.59	22,657.58	284,870.18
Motor Supplies .....	11,456.09	84.70		42,586.82	6,056.99			839.59	1,439.89
Light, Power and Fuel .....	1,808.84	8,196.44		571.66	252.95			1,514.70	1,501.27
Insurance .....		594.93	1,372.12	192.51	7,068.53	1,867.28	40.20	197.40	350.26
Postage, Telephone and Telegraph ..	14,888.59	1,262.52	290.76	13,348.14	12,703.75	1,021.00	218.48	4,132.23	47,865.47
Rental of Equipment, Offices, Auto Storage, etc. .....	251.52	14,456.53	258.30	141,956.20	6,374.64	512.86	65.00	3,135.16	167,010.21
Bounty Payments and Grants .....	200.85		6,000.00			72,731.50		2,000.00	80,731.50
Refund of Receipts .....					2,455.00				2,655.85
Fees: Artists, Attorneys, Medical, Taxidermy, etc. .....		7.50	301.50	1,122.55	219.75			141.50	14,542.79
Bear Damage Claims .....					984.65				984.65
Other Maintenance Services and Ex- penses .....	1,189.57	51.76		500.46	2,159.10	62.35		998.42	5,923.76
Newspaper Advertising .....				326.18	8,177.93				8,504.11
Printing, Binding and Paper .....	5,917.74	1,028.27	3,129.58	7,442.76	4,532.35	537.15	271.45	78,542.56	101,421.86
Contributions to State Employees' Re- tirement System (1) (through De- partment of Revenue) .....	45,121.66								45,121.66
<b>TOTAL EXPENDITURES ..</b>	<b>2,858.27</b>	<b>3,913.10</b>	<b>1,769.40</b>	<b>9,085.21</b>	<b>12,045.56</b>	<b>374.30</b>	<b>1,429.13</b>	<b>2,552.03</b>	<b>34,027.00</b>
	<b>\$174,726.78</b>	<b>\$1,000,389.70</b>	<b>\$86,161.19</b>	<b>\$1,685,502.13</b>	<b>\$688,409.17</b>	<b>\$87,004.95</b>	<b>\$88,884.35</b>	<b>\$237,704.54</b>	<b>\$4,028,782.81</b>

Cash Balance in State Treasury to credit of "Game Fund" May 31, 1951 .....

\* Excludes \$93,000 War Bond Investment which can be converted into cash when necessary.

(1) These items e.r. paid out of the Game Fund upon requisitions drawn by the Dept. of Revenue and are included herein to complete the picture of the Game Fund finances.

\$1,490,933.16\*

**TABLE No. 3. PENNSYLVANIA GAME COMMISSION STATEMENT OF REVENUE, EXPENDITURES AND CASH BALANCES—FISCAL YEAR JUNE 1, 1951 TO MAY 31, 1952**

REVENUE		\$1,490,933.16
Cash in State Treasury to credit of "Game Fund" June 1, 1951 .....		.....
Receipts June 1, 1951 to May 31, 1952:		
Hunters' Licenses (including Resident, Nonresident, Antlerless Deer and Archery) .....		\$3,266,841.88
Game Law Fines .....		146,497.25
Special Game Permits (Fur Dealers, Taxidermists, Game Propagators, etc.) .....		18,370.00
Interest on Deposits .....		13,151.13
Sale of Forest Products from Game Lands .....		48,998.55
Sale of Animal Skins .....		9,070.19
Sale of Unserviceable Property and Equipment .....		4,520.04
Rentals from Buildings and Land .....		27,417.43
Sale of Publications .....		37,477.72
Federal Aid for Wildlife Purposes (75% of cost of approved projects) .....		457,777.89
Miscellaneous Items .....		24,131.11
Redemption of War Bond Investment .....		93,000.00
Total Receipts from All Sources .....		.....
Total Funds Available during Year .....		.....
		4,147,253.19
		\$5,638,186.35

## CLASSIFICATION OF EXPENDITURES BY ORGANIZATIONAL UNITS

Classification of Expenditures		Executive Office and Accounting and Ser.	Game Propagation	Wildlife Research	Land Utilization	Wildlife Protection	Bounty Claims	Conservation School	Conservation Education	Total
Salaries	.....	\$91,151.84	\$131,571.61	\$32,813.03	\$215,332.48	\$454,435.00	\$15,387.73	\$14,378.15	\$70,311.65	\$1,025,381.49
Traveling Expenses of all kinds, including auto mileage	.....	5,102.40	28,106.66	6,408.45	56,642.07	164,556.20	943.08	917.81	14,653.08	277,329.75
Deputy Game Protectors (Wages and Expenses)	.....	.....	.....	.....	.....	.....	101,094.62	.....	.....	101,094.62
Cooperative Farm-Game Program	.....	124,015.00	.....	.....	.....	.....	.....	.....	208,754.24	333,669.24

(1) These items are paid out of the Game Fund upon requisitions drawn by the Department of Revenue and the Department of State and are included to complete the picture of the Game Fund finances.

**DOG TRAINING PRESERVES**

Serial Number	Location		Acres	Class of Dogs Which May be Trained	Hunting Limitat
	County	Township			
2	Montgomery	Upper Dublin Whitemarsh	160	Retriever dogs, including Spaniels, and non-slip retrievers. Properly licensed field trials may be conducted.	No ordinary hunted. Commercially agated and tagged ants, as well as nontail rabbits killed in connectic dog training.
3	Lycoming	McHenry (near Haneyville)	800	All classes of hunting dogs. Field trials may be conducted.	No small game hunted or killed. D bears may be killed in season.
4	Forest Clarion	Green Farmington	985	Bird dogs only. Field trials may be conducted.	No small game or be hunted or killed may be killed in se
6	Washington	North Franklin	578	All classes of dogs. Field trials may be conducted.	No game of any ki be hunted or killed.
7 Black Grouse Trial Area	Lycoming	Brown (near Pump Station)	715	All classes of dogs, but especially grouse dogs. Field trials may be conducted.	No small game hunted or killed. D bears may be ki season.
8	Forest	Jenks	1,000	Bird dogs only. Field trials may be conducted.	No small game hunted or killed. D bears may be ki season.
9	Forest	Jenks	1,000	Bird dogs only. Field trials may be conducted.	No small game hunted or killed. D bears may be ki season.
10	Forest	Jenks Barnett Millstone	1,000	Bird dogs only. Field trials may be conducted.	No small game hunted or killed. D bears may be ki season.
11	York	Fairview	108	All classes of dogs. Field trials may be conducted.	No small game hunted or killed. I bear may be ki season.
9		Total	6,346		

Many field trials were held for beagles and this sport attracts numerous participants.



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## 1952 Pennsylvania Open Seasons for Waterfowl and Other Migratory Game Birds Under Federal and State Regulations

SPECIES	OPEN SEASONS		DAILY BAG LIMITS	MAXIMUM POSSESSION LIMITS*	LEGAL SHOOTING DAYS & HOURS (SUNDAYS EXCEPTED)	
	FIRST DAY	LAST DAY			BOTH DATES INCL.	HOURS (EASTERN STANDARD TIME)
Sora	Sept. 1	Oct. 30	25	25	Sept. 1 to Oct. 19 . . . $\frac{1}{2}$ hr. before sunrise to sunset	
Rails (except Sora) and Gallinules	Sept. 1	Oct. 30	15	15	Oct. 20 to Oct. 30 . . . $\frac{1}{2}$ hr. before sunrise to 1 hr. before sunset	
Woodcock	Oct. 15	Nov. 14	4	8	Sept. 1 to Oct. 19 . . . $\frac{1}{2}$ hr. before sunrise to sunset	
Doves	Sept. 15	Oct. 14	8	8	Oct. 15 to Oct. 31 . . . $\frac{1}{2}$ hr. before sunrise to sunset	
Ducks (except American and Red-breasted Mergansers)	Oct. 20	Dec. 13	4 (only 1 wood duck)	8 (only 1 wood duck)	Nov. 1 only . . . 9:00 a.m. to sunset	
American and Red-breasted Mergansers	Oct. 20	Dec. 13	25	(any number after first day)	Nov. 1 only . . . 9:00 a.m. to $\frac{1}{2}$ hr. before sunset	
Geese (except Snow)	Oct. 20	Dec. 13	3**	3**	All Other Days of Open Season— $\frac{1}{2}$ hr. before sunrise to 1 hr. before sunset	
Coots	Oct. 20	Dec. 13	10	10		
Brant	Oct. 20	Nov. 3	3	3		
<b>NO OPEN SEASON</b> —Wilson's Snipe (Jacksnipe), Snow Geese, and Swans.						

\* Possession 90 days after close of season where taken.

\*\* The daily bag must not contain more than three Canada Geese, but may in addition include three Blue Geese which is also maximum possession limit.

### MIGRATORY BIRD HUNTING METHODS

**Permitted:** Shotgun only, not larger than 10-gauge, fired from shoulder (including hand-operated and semi-automatic repeating shotgun of not more than 3-shell capacity, which must be plugged to 3 shots so that plug cannot be removed without disassembling the gun); dog; blind; boat propelled by hand; floating device other than sinkbox; artificial waterfowl decoys. Injured or dead waterfowl may be picked up by means of a motorboat; sailboat or other craft. This year shooting is permitted from a boat or other craft having a motor attached if such craft is fastened within or tied immediately alongside of any type of stationary hunting blind.

**Prohibited:** All rifles; live duck or goose decoys; automobile, aircraft, sinkbox

any place where salt or shelled, shucked, or unshucked corn, wheat, or other grains, or other feed of similar use in attracting such birds is placed, exposed, deposited, distributed, scattered, or present at any time during or within two weeks prior to the open season on such birds. In addition, such birds may not be taken under any circumstances by the aid of salt, or shelled, shucked, or unshucked corn, wheat, or other grains, or other feed similarly used to lure, attract, or entice such birds, to, on, or over the area where hunters are attempting to take them. Water fowl may not be taken by means, aid or use of cattle, horses or mules and no motor-driven land, water or air conveyance or sailboat may be used to concentrate, drive, rally or stir up waterfowl or coots.

### FEDERAL STAMP FOR MIGRATORY BIRD HUNTING

It is unlawful for a person over the age of 16 years to take migratory waterfowl unless he carries on his person an unexpired Federal migratory bird-hunting stamp validated by his signature written in ink across its face. Not valid after

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# Game News



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DECEMBER 1952

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# THE STORY BEHIND THE COVER

beaver or otter, the "musquash" leads the nation in total value and in numbers trapped. During the 1949-50 season, for instance, more than 500,000 'rats were purchased by Pennsylvania fur dealers, enriching Keystone State trappers by \$766,480. Skunks trailed along in second place, with little more than one-tenth of that number trapped during the same period.

Although the muskrat's fur is good looking and long wearing, until recently the poor fellow received little credit for possessing a quality coat. Muskrat garments were commonly marketed under the misleading names of Hudson seal, plucked beaver, electric seal, brook mink, loutrine, riversable, and other equally misleading misnomers calculated to sound glamorous to milady's ears. However, a recently enacted federal law requires furriers to incorporate the true name of the animal into the name given its finished pelt and little Johnny Muskrat finally is making a name for himself.

Possibly no other wild animal is as dear to the hearts of the farm lad as is this marsh and stream dweller. He is easily trapped and his pelts furnish the necessary extra cash for such luxury items as rifles, shotgun shells, hip boots or other items desired by every young heart.

The muskrat is well adapted to life in and about water. His large hind feet are partially webbed and his tail is flattened laterally to form a rudder-like aid to swimming. Although ungainly on land, the 'rat is a strong swimmer, can dive with astonishing ease, and can remain under water for unbelievably long periods of time.

In marshy areas the rat's home is usually a "lodge" constructed of reeds and rushes. In streams he generally lives in burrows excavated in the banks. His food consists chiefly of roots, grasses, bark and other vegetable matter, but the little rodent is also quite fond of mussels and other mollusks. Generally speaking, Johnny Muskrat is a harmless fellow, but occasionally he evokes a farmer's wrath by acquiring a taste for cultivated crops. And his riddling of farm pond dams and banks with burrows often brands him a number one pest.

Muskrats are preyed upon by minks, foxes, hawks and owls, but usually only man and his steel traps can noticeably reduce their numbers. Several years ago the muskrat population in Pennsylvania took an unprecedented drop and the Game Commission closed the 1950-51 season to give the little animals a chance to recover. This they did in a surprisingly short time and Johnny Muskrat is once again leading the Keystone State's list of furbearers.

# PENNSYLVANIA *Game News*

Published Monthly

(Semi-Monthly in September and March)

by the

Pennsylvania Game Commission

Commonwealth of Pennsylvania

JOHN S. FINE, GOVERNOR

★

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## PENNSYLVANIA GAME NEWS

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No. 9

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★  
Cover Kodachrome  
by  
Ralph M. Cady

## CORRECTION

The cover kodachrome for the October issue, credited to W. C. Shaffer, was taken by Don Miller, Conservation Education Assistant in the Commission's Southeast Division. GAME News apologizes for the error and is glad to give Mr. Miller due credit.

## HOW TO SUBSCRIBE

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# Nature's Gifts

A snow-laden hemlock, glistening in a dawning sun,  
more beautiful than any Christmas tree . . .

The surprise of color as a gamebird bursts into an  
azure sky . . .

The marvel of a rainbow ring curving over fertile  
farmland . . .

The coolness of clear water, cascading down a  
mountainside . . .

The sparkle in a boy's wide eyes on the morning  
of his first hunt . . .

A wedge of geese winging against a silver moon . . .

The majesty of a deer, standing like a statue on a  
ridge-top skyline . . .

The call of a bobwhite on a calm spring morn-  
ing . . .

The chatter of a squirrel in a forest touched with  
gold and scarlet . . .

The devotion in a dog's face as you rest at hunt's  
end . . .

The mystery of a wildflower, slowly unfolding its  
pastel petals in some secluded glen . . .

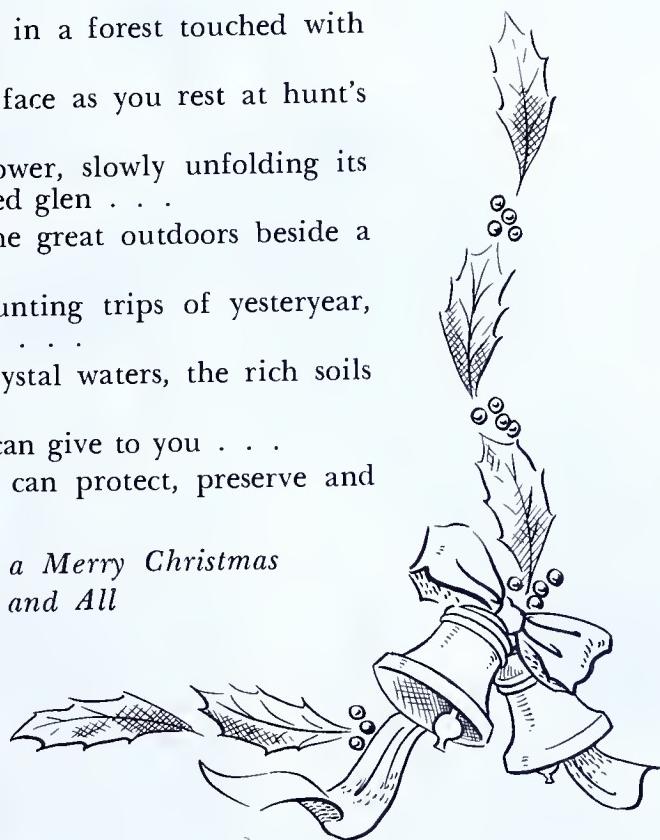
The companionship of the great outdoors beside a  
flickering campfire . . .

The memories of the hunting trips of yesteryear,  
the hopes for years to come . . .

The green forests and crystal waters, the rich soils  
and wild creatures . . .

The gifts that only God can give to you . . .  
the presents that only you can protect, preserve and  
perpetuate.

*Nature's Gifts offer a Merry Christmas  
To One and All*



OUT of the hundreds of shots that have blasted from the muzzles of the shotguns I have used over many years of hunting, only five still echo vividly in my memory.

Five shells . . . just enough to fully load the sixteen gauge pumpgun that currently collects my game dinners. But the pleasure of the experiences in the fraction of a second that it took for those five rounds to discharge is still with me. Hunting is primarily recreation, but there must be more to it than that if the sport is to add its proper coin to the enrichment of a man's life.

Listen to the aged ninrod tell of his experiences for a few minutes, and you will soon feel and see the

truth of that statement. His eyes take on a new glisten and his throat fills with chuckles of fond remembrance. But you will find that his pleasure was not so much in the shot he made, but in the circumstances under which it was made.

So it has been with those shots I remember best.

None of my shots were extremely difficult. Two were at rabbits, two at ringneck pheasants and one was at a deer. And, the one that still echoes fondest has lasted longest. It was the first.

It was a straight away easy shot at a cottontail that I saw sitting along the edge of a field in winter wheat one frosty morning. I was just a kid.



We have an unwritten code among sportsmen in our section which says that any game in the nest must be kicked out" for the shot. Among the boys with whom I associated, there were those who didn't follow the code so closely. That title, "sportsman," had a strong appeal to me, however, and I declared vociferously that I would never take unfair advantage of game.

That was before I went hunting. After watching other hunters fire away at, and often miss, the elusive target that a twisting cottontail frequently presents, I almost hoped that I would never see one "settin'." Let that time, that test, was bound to occur. And, outcome of the experience could well determine how well I would play the game in the future.

I was alone when I met my first rabbit in the nest. It was sitting next to heavy brush at the edge of the field, and to the kid who walked almost upon him, it was a tempting target. But that kid's conscience was suddenly blaring with the promise he had made to "play fair."

The rabbit sat tight while the two big hammers on the old double-barrelled Damascus twelve gauge clicked back. And underneath the hand-me-down hunting coat a boy's heart was bumping against his ribs in painful fashion. Then the cottontail drew his feet beneath him as a booted foot stirred the grass near by. Like a watermelon seed the rabbit popped from the nest and raced up the edge of the field as twin barrels lined up

## *Shots To*

## *Remember*

By Keith C. Schuyler

on his tail, lifted a bit, then roared. A bundle of brown fur rolled a few feet farther, then stopped.

I remember how the kid ran up and grabbed it. Then he stood there a minute, heart bursting with pride as he looked around in the almost impossible hope that someone had seen that shot. In a moment he realized that the warm feeling in his chest was compensation enough. But that old low-brass casing and the left hind foot of the rabbit went on many hunting trips for years afterward.

The second shot I remember so well was, appropriately enough, at the first ringneck to grace the leaky lining of the old hunting coat. It was during the last three days of the hunting season, and this same kid was out trying to collect his first bird. Anyone who has hunted the farming country of the East knows what his chances are of killing a ringneck after the first few days of the season without a good dog. This particular season was no exception. In three days, the only target that had presented itself was a half-grown rabbit . . . too small to shoot.

Even an eager kid can become disgusted in that time, especially when he has sacrificed his Thanksgiving vacation from school for a tiresome hike over bare, cold, November fields. And, he had given up when an old lady stopped by to tell of seeing a rooster crossing the road a mile from my grandfather's farm where I was staying.



My older brother, Stan, was there at the time. He grabbed his gun, me and his Model A; then all of us headed for the tomato patch where the bird had last been seen. Down between the rows of frozen plants interspersed with dry summer grass we started. My weapon at the time was a full-choke twelve gauge single-barrel owned by my brother. It would reach far, but the shot grains enjoyed a fraternization which didn't allow much for spread.

The old cock bird exploded from the grass when we were half way through the field. And the single-barrel followed him every inch of the way as he cut back to the left in a sweeping turn at full throttle.

This was my chance; my only chance. I held on the bird so long that Stan, fearing that I was unable to shoot, whammed away at the rooster.

He missed.

Then the muzzle of the long Tom found the patch of sky it was seeking and a blast of No. 4's rushed to meet the ringneck. The beautiful cock crumpled in mid air, then angled to the hard dirt in a burst of feathers. Its wings beat out a brief applause for the boy rushing toward it as the season ended.

It was actually a pair of ringnecks and a pair of shots that brought my third great thrill a number of years after that first bird. In fact, it was in the fall of 1945, in the middle of the small game season. My younger brother, Wayne, did not receive his Army discharge until hunting was in its third week. Our first trip together was for rabbits since the ringneck population was depleted as usual to a point where chances of success were at a minimum.

It was a fair day's hunt, and our group of five had collected enough cottontails to satisfy us as the five o'clock quitting time approached. Wayne and I had become separated from the rest, since we had much to

talk about after two year's separation, and we decided to wind up the day near a patch of woodland.

Wayne was happy with the day's hunt, in view of the lateness of the season, but he regretted not having had a chance at a ringneck. We had always opened the season before the war in excellent ringneck country.

We were approaching the wood in a field strewn with a thin growth of goldenrod when it happened. From nowhere a big rooster catapulted out in front of us in a flash of color that sped toward the not-too-distant trees. I had the more favorable position for the shot but held fire, waiting and hoping for Wayne.

He was equal to the occasion. His first shot altered the cock's course to the goldenrod in a manner most satisfying. But even as he was squeezing on the trigger, another rooster left the ground near my feet. My load of No. 6's brought a repeat performance before the echo of the first shot was dead.

Wayne and I met a moment later, each holding a bird. Birds that seemed to have been placed there just for us. For a moment we just stood there grinning at each other, then we shook hands. A bit melodramatic maybe, but that's the way we felt.

Another rabbit brought a shot just two years ago that I count among the five although it was another relatively easy one. Again it was a last day affair, and I had the afternoon off to wind up the season. I would have been more than satisfied with any shooting at all, but it turned out to be one of those memorable days when the remaining rabbits were just sitting out asking for it.

The first three came easy. Many might think that I should have been satisfied to call it a day and a season, and they have legitimate reason for thinking so. But never before nor since have I found hunting so good

the closing day. With four the unit, I was selfish enough on this occasion to want to fill my day's bag of rabbits if only for the novelty of it. I began to hunt hard for the burth.

There was a small patch of grass at I had by-passed several times during the season. With my wristwatch urging me back toward the car, I came upon this bit of cover as the shadows were rapidly darkening the hedgerows.

When almost through the patch, I suddenly noticed what at first appeared to be a round rock in the grass. A closer look proved it to be what I hoped. After a quick glance to check the location of the dog, I bounced the rabbit toward the nearby hedge.

He didn't make it.

I looked at my wristwatch and found that there were just five minutes remaining to the season. Removing the shells from my gun, I headed up the hill toward the car. It was with a keen sense of satisfaction that I saw three more rabbits before hit the road . . . seed for the next season.

The most important shot, since it was at a deer, I have saved for last although it happened when I was just out of high school. I had taken

a job without stipulating that I would expect to take the first day of the deer season off to go hunting (a mistake I never made again.) It was, they told me, necessary that I work at least until noon.

My father, brothers and friends all left for the woods about the same time that I left for work. And, to top it all off, I didn't get free until three o'clock that afternoon. More out of sentiment and desperation than anything else, I grabbed the aforementioned Model A and an old Spencer shotgun to head for some brush patches near town. That shotgun deserves a word of mention since it is a product of the last century, the

first successful repeating type shotgun manufactured on a large scale. It has a top ejection, and the ejection on the one I was using required a bit of manual manipulation after each shot to remove the empty shell.

Near the spot I had chosen to finish eating out my heart there had been two does a few days before that



I had seen while rabbit hunting. But, everything was cold and still when I arrived with but an hour of the first day remaining.

Just as I was about to give up, a shot sounded from the direction of an apple orchard near by, and sudden hope flared in the place of my bitter disappointment. In moments, a doe flashed out of the gathering gloom and bounced past me into a birch thicket.

As I turned to go, another bobbing shape appeared; then it stopped. A quick glance showed it to be a buck, a big one. I threw up the old Spencer and touched off the first shot as the deer wheeled at a ninety degree angle.

He stopped behind some brush about 100 yards away, and I cleared some of it away with a second slug from the Spencer. Meanwhile, I ran parallel to the deer to head him off, working the empty shells out with my fingers after each shot.

At last, after more running and more shooting, I caught the buck in the open field. He was silhouetted against the glow of the sunken sun, frosty breath steaming above his magnificent rack of antlers. Dropping to one knee, I aimed the Spencer carefully on his shoulder. At the shot, the buck reared up on his hind feet and then toppled over backward. I ran up to administer the coup-de-

grace and discovered that I had just fired my last shell.

That one was enough. At seven yards it had broken the deer's neck and severed the jugular vein. He had twelve well defined points and was dressed at 180 pounds; a big deer in our neck of the woods.

These echoes out of the past are the ones that I especially cherish. Of course there have been many happy days when hunting was good, and my share of both small and large game has been commensurate to the effort expended. And, every day has been time well spent.

We make difficult shots and difficult misses, then soon forget them. But it is not the shot itself or the kill that makes you remember. It is the circumstances surrounding the experience that keeps the shots echoing down through the years.

The run down the field is often better remembered than the touch down; a score on a bunt can seem more important than a home run. The score is seldom considered for long.

But we can always remember how much we enjoyed the game.

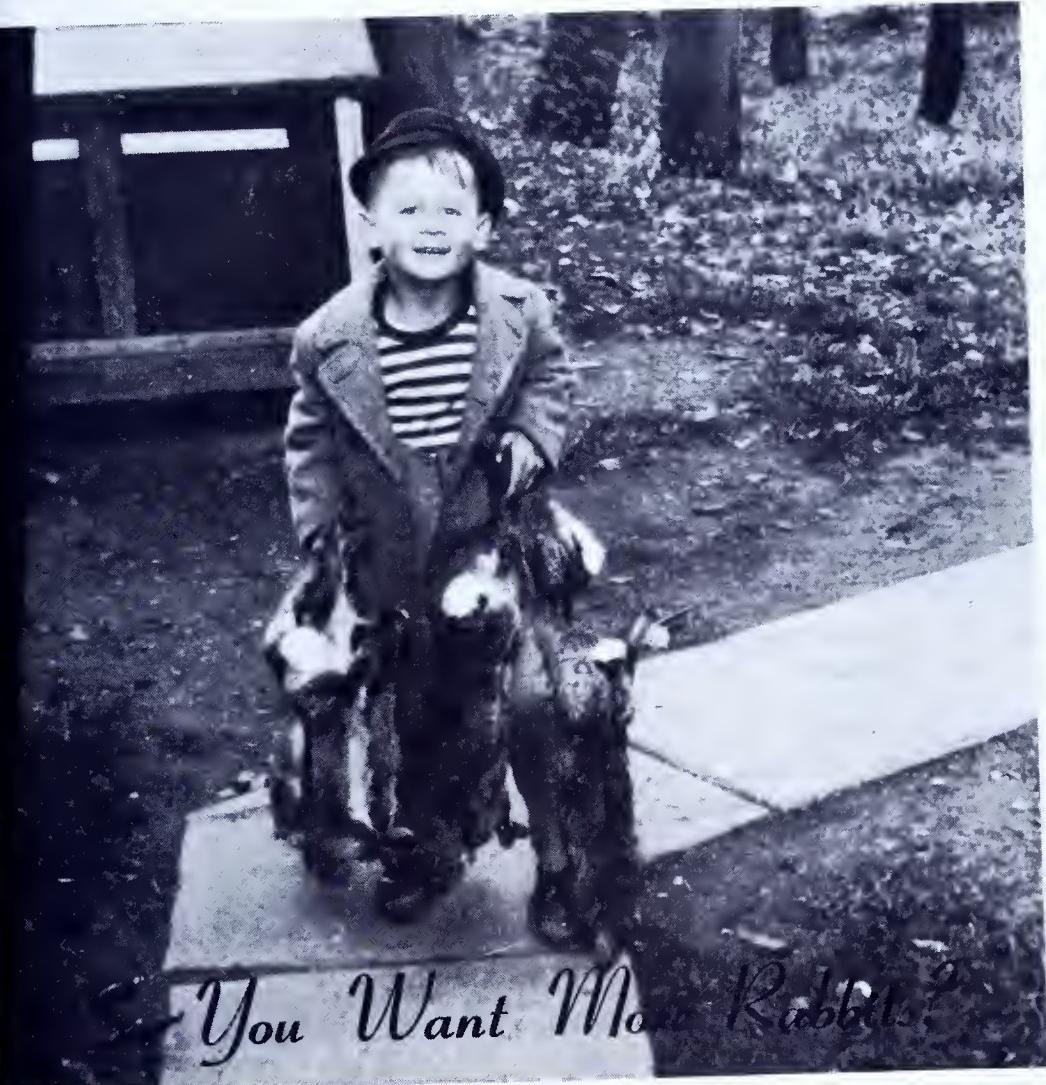
. . . *The End.*

#### THE NATIONAL FORESTS

During the past year, an estimated 3,520,000 anglers visited our national forests. Here they found camping facilities, the finest of scenery, and good fishing. After passing plenty of "No Trespass" signs, the anglers found big areas where they were welcome—180 million acres of forest land available for recreation as well as for watershed protection and the growing of timber.

The Forest Service cooperates closely with the State Fish and Game Departments in fish management on the national forests. In this program the States regulate seasons and bag limits and do most of the required fish stocking, while the Forest Service is concerned with the protection and management of the habitat. On these public lands good timber and range management practices, coupled with fire protection, maintain a protective cover of vegetation along stream banks and on the watershed. This mantle of vegetation holds the soil in place, reduces the damaging effects of floods and silt, and by shading the streams maintains lower temperatures.

If the Forest Service folks were interested only in the water and timber resources, their viewpoint would be understandable. The fact that they are also vitally concerned with fishing and hunting, and other recreational use of the land, indicates that this branch of the federal government has an excellent understanding of wise resource use. We like their attitude.



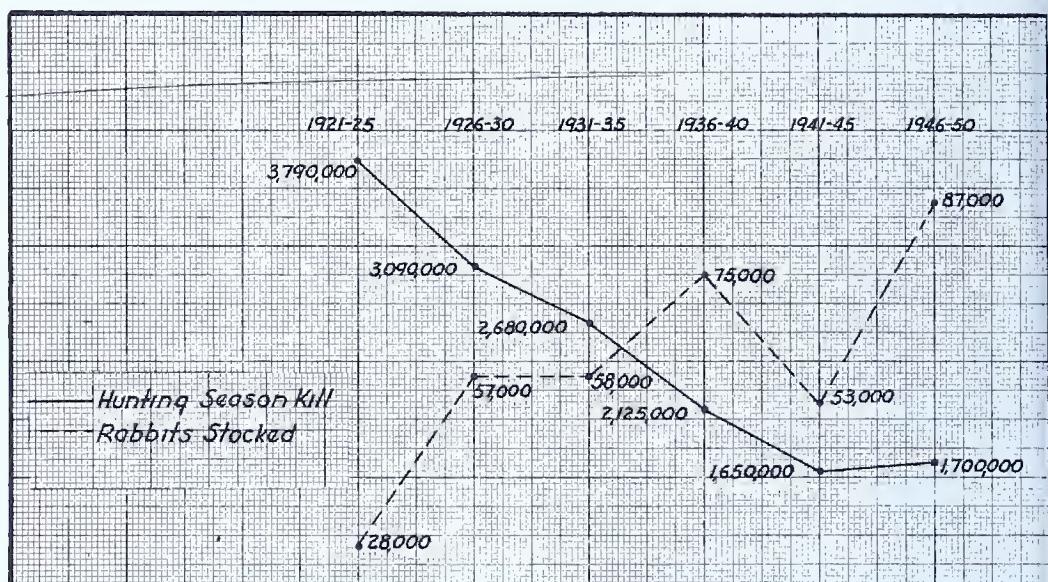
*You Want More Rabbits?*

By Roger M. Latham

**T**HIS year as usual, some Pennsylvania rabbit hunters have requested the Game Commission to import and stock western rabbits in the state. Although the Commission wants to carry out the wishes of the sportsmen whenever these are sound and practical, they are opposed to the importation of cottontails to supplement our native stock. Studies in Pennsylvania and other states have demonstrated repeatedly that such purchases make no contribution to the hunter's bag. And, there is always the danger of introducing animals with undesirable sporting character-

istics, diseases, and parasites, with possible detrimental results.

Time after time, and place after place, it has been proved that our own native breeding stock is almost invariably adequate to produce young rabbits in excess of the actual carrying capacity of a particular covert. In other words, a certain acreage will support just so many rabbits. This number is determined primarily by the amount of good cover (weeds, brush, groundhog holes, brushpiles, stone piles, etc.), the amount of good food, and the kind and quantity of predators.



Of course such things as weather, diseases, parasites, and even over-crowding will further limit the total production. If 20 female cottontails can produce enough offspring to satisfy the carrying capacity of a certain area, then the addition of 20 more, or 100 more, will add nothing to the final result. In fact, this addition may do real harm.

Ohio had a sad experience some years ago which illustrates this point. A 270 acre tract was enclosed with a vermin-proof fence and pole traps were placed in the enclosure to catch hawks and owls. Artificial dens and feeding stations were established, and a considerable amount of food and cover development work was done to provide ideal conditions for peak production. From the beginning in 1932 to 1936, 5,000 imported rabbits were stocked on this rabbit farm with the thought that many times that number could be trapped off during the winter for distribution over the state. This trapping over the four winters produced 143 cottontails, and, during the winter of 1936, only 34 were caught. Because these rabbits were so badly overcrowded, they died from disease and fighting. Experiments have shown that they are very intolerant to high densities, and even

two caged together in a wire pen will regularly fight until one or both are dead.

Just suppose the Commission did accede to the wishes of some of the rabbit hunters and imported 75,000 cottontails this year. These are almost exactly evenly sexed, so that we would release 37,500 females. From several studies we know that mortality is high during the first few weeks after release. These animals are released in strange territory, after a trying trip by train or truck, during the coldest part of winter (the only time they can be shipped). We know that *at least* one-third are lost before April 1, and probably it is much higher state-wide. At any rate, the winter loss reduces our female breeders to 25,000 or less.

Pennsylvania has a total area of 28,000,000 acres and about 20,000,000 acres of this can be classed as the rabbit producing area. The other 8,000,000 acres comprise the badly overbrowsed deer range which is no longer of any value as rabbit cover. Distribute the 25,000 rabbit does evenly among these 20,000,000 acres, and you have provided an additional breeding doe on every 800 acres. Can anyone expect this to influence the total kill in November?

By relating the number of rabbits tocked to the rabbit kill figures for Pennsylvania since 1915, we come up with some more enlightening information. During 18 of the 34 years, an *increased* stocking resulted in a *decreased* fall kill. During 9 of the emaining 16 years, a *decreased* stocking resulted in an *increased* kill. Certainly the fluctuation in annual rabbit harvest between a low of 1½ million and a high of 4½ million cannot be explained by the addition or loss of a few thousand imported cottontails.

We have just as many positive proofs that our own native brood stock is adequate. We know that a healthy doe is capable of producing as high as 15 to 20 young in a single summer. Our census estimates indicate that we have a spring breeding population of *at least* two million rabbits. These probably give birth to a minimum of ten to fifteen million young during the summer. The average hunting kill is only about two million rabbits, and perhaps three million more survive the hunting season. This means that we lose five to ten million young rabbits every year during the warmer months. What possible good can it do to add a few thousand more to this tremendous number which is going to be lost anyway? Common sense cannot accept the practicality of spending money for wasted rabbits.

Our own and other rabbit studies have demonstrated that from 60 to 80 per cent of all rabbits survive the hunting season. On one study area just north of Pittsburgh last year, only 20 per cent of the cottontails were killed by hunters even though it was literally combed day after day by scores of hunters. And this was not guesswork! The area had been live-trapped prior to the season and the rabbits ear-tagged. After the season, it was again live-trapped and a check made of the number of rabbits still alive. Eighty per cent sur-

vived this heavy hunting pressure. The same results were obtained on study areas in other heavily hunted parts of the state. Survival was always highly satisfactory for reproduction.

In Michigan, they attempted to shoot all of the rabbits from a farm. For sixteen consecutive Decembers they shot every rabbit possible to see whether the species could be controlled as a pest by hunting. Every year the recovery was satisfactory in spite of this extreme pressure.

Our own trapping program proves that recovery can be complete and rapid even after an area has been "milked dry." Cities, parks, and other closed areas are often trapped until there appears to be no rabbits left with the hope of preventing damage to gardens, orchards, and shrubbery. By the following fall or winter, they're back in the same places and in about the same numbers.

And now what about rabbit ranches or artificially propagated rabbits? It will come as a surprise to some hunters that the Pennsylvania Game Commission went through the painful process of attempting to raise rabbits in pens and enclosed fields back in the period from 1931 to 1936.

For the "range" propagation, two pens of about four acres each were used. The one pen had a wire top to keep out hawks and owls, and the other had no top. In three other experiments, the pens consisted of two sections, one termed the "breeding pen" and the other the "growing area." The breeding pens were small enclosures within the growing area. The adult rabbits were confined to the breeding pens, but the young rabbits could escape through the one and one-half inch mesh into the growing area after leaving the nest. It was hoped that the production from these pens might equal four rabbits per breeding doe, but this goal was never realized. In the five breeding seasons during which this experiment was in progress, only 240 rabbits on the

average were produced annually. It was concluded that, although some rabbits could be produced in captivity, the cost of pens, feed, care, etc., made the venture prohibitive. Other states have long since come to the same conclusion.

In 1935 and 1936, propagation of cottontails was attempted in individual pens of different sizes and types. This was a dismal failure from a production standpoint. Regularly the doe would kill the buck if he were placed in her pen when she was not receptive. Few young rabbits survived the first few days because they were commonly deserted by their mothers and never nursed.

Two things should be kept in mind when thinking in terms of artificial propagation of cottontails. First, unlike quail, ringnecks, and wild turkeys, the rabbit is born naked and helpless and must be fed by the mother for the first two weeks or more. The game birds just mentioned can be held in brooders and fed successfully by man. Second, these game birds will produce from 30 to over 100 eggs in a single season. This permits high production from each breeding female. But in rabbits, the birth rate in pens is no greater than in the wild, and, for that reason, offers no numerical advantage over wild production.

And another thing, if we can produce a fair number of rabbits by providing food and cover, why go to the expense and bother of trapping them from the area and moving them to open hunting ground? Why not let the hunters harvest them right on the area, and expand our rabbit management work so that these good hunting spots are developed far and wide. It seems foolish to close good rabbit covers to hunting, pay to have the rabbits moved a few miles, and then let the hunters shoot them if they can find them. From research studies, it is known that these transferred rabbits scatter widely when released, and

many are killed by predators and/or the highways while they are attempting to return home. And incidentally preliminary studies indicate that many of them go back home within a few days if not removed too far.

If artificial propagation is not practical, and importing western rabbits does not increase the hunter's bag and we do not need additional breeding stock, what can we do to produce more rabbits for the hunter? The answer has been found on several experimental areas in Pennsylvania and other states. Pennsylvania's wildlife research men have been able to triple rabbit populations on open hunting territory, without any predator control or any stocking, merely by increasing the amount and quality of the food and cover. So much of our abandoned farmland offers very little food for cottontails even though the cover may be reasonably adequate. On the other hand, much of the intensively cultivated farmland offers a superabundance of good food but practically no cover. The solution to our problem of producing rabbits is to supply food and cover where it is needed.

An outstanding example of what can be accomplished by land management is presented by the history of the Letterkenny Ordnance Depot in Franklin County. Before this area was purchased by the Army, it was typical of much of the intensively cultivated farmland in the Cumberland Valley. In winter the barrenness of this land is remarkable. It presents a desolate picture of plowed fields, winter wheat and barley, corn-stubbles, and closely cropped hay fields and pastures, all separated by the traditional 3-strand barbed wire fence. In spite of an abundance of clover and other excellent rabbit foods, these animals can exist only in token numbers because cover is practically nonexistent.

But what happened when these same farms were abandoned and per-

mitted to grow up in weeds and brush? *Without any stocking whatsoever*, this meager cottontail population skyrocketed so rapidly that the Game Commission was able to box trap 2,086 rabbits from a small portion of this area during the second winter. And production has remained high ever since with over 4,000 being trapped and transferred during recent winters.

We have proved conclusively what land management work will do for cottontails. Rabbits will breed better and grow bigger if we do nothing but lime and fertilize the soil, but outstanding results are achieved when additional food and cover work is done. Ladino clover planted in strips where food is scarce can do wonders, and multiflora rose, Japanese honeysuckle, low evergreens, and other cover plants can mean the difference between success and failure on heavily cultivated farmland.

We know what will and what will not produce more rabbits for the recreation of the hunter. We have the technical knowledge necessary to do a good job. The next essential is for the Game Commission, sportsmen's clubs, and individuals to work together to put this knowledge to use. The Game Commission cannot do the job alone on both public and private lands, but it can do its part and provide guidance and advice for clubs and individuals who want to help their own sport. Don't forget, a patch of good food or cover as large as your living room in the right place would go far toward providing your sport for the coming year. One eroded gully, if properly planted and filled with brush piles and rock piles, can furnish a season limit of rabbits. Why not "adopt a gully" for sports sake and at the same time earn the gratitude of some farmer?

. . . *The End.*

## SPORTSMEN, WEIGH THE FACTS AND DECIDE FOR YOURSELVES!

### \$100,000 Spent for Breeding Stock

\$100,000 will pay for the stocking of about 75,000 rabbits.

Studies show that at least one-third will be lost before the breeding season—April 1.

25,000 of the surviving 50,000 are females.

25,000 female rabbits evenly distributed over 20,000,000 acres of Pennsylvania rabbit cover equals one rabbit for every 800 acres.

Can we afford to spend the license revenue of 33,000 hunters to put one rabbit on every 800 acres of land?

### \$100,000 Spent for Food and Cover

\$100,000 will purchase the seeds or seedlings of one to four million food and cover producing shrubs.

Planted upon waste areas of farms, these plants will furnish new habitat for thousands of native rabbits for many years.

This food and cover will also increase the numbers of ringnecked pheasants and bobwhite quail.

These plants will reduce soil erosion and restore soil fertility so that more and better food and cover (and game) can be produced.

Within a few years, the planting program should easily produce hundreds of thousands of additional rabbits yearly for the hunters to harvest.

# Outdoor Reveries

By John H. Day

## The Edge of Winter

DECEMBER came to the country-side with disarming softness, riding down the calendar on a warmish breeze which swept all menace from the skies and pushed the mid-afternoon mercury close to the 60 mark. The sun made short work of the frost blanket which jewelled the dawning. By noon the impatient countryman had closed his desk and was deep in the hill country, properly booted and garbed against the muddy footing and the tall slashing blackberry canes in the thickets.

The breeze pushed hard all day, finally whipping the few clouds into long mare's tail pennons. The countryman unlimbered his walking stick and struck out boldly through an abandoned orchard. Now the rolling barrage of the small-game hunters is silenced, and the outdoorman can loiter once again through the thickets.

The high-pitched tiny notes of the tiny golden-crowned kinglet could be heard all through the treetops. Only the hummingbird and one of the wrens are smaller than this courageous feathered atom, but his heart is big enough to dare the might of Winter. Farther on a small group of



Leo Smith

juncos complained at the intrusion and flashed their white tail feathers as they retreated deeper into the old-field tangles.

The countryman moved down to the edge of a wide reservoir, hoping for a belated duck or two. Sponge ice stretched across a wide area of the dam, and the open water rolled with the punch of the breeze but harbored not even a single mud hen. A lone killdeer stood out on a muddy point and paged himself fretfully, but the only answer was the distant conversation of some quarrelsome crows.

The breeze churned through the clinging brown leaves in a grove of shingle oaks just across the dam, kicking up a roar like a heavy trout stream breaking over rocky riffles. In a denuded thorn bush last Summer's

catbird nest was now clearly revealed. The countryman cut down the forked branch to which a vireo had moored her cozy cup, adding this souvenir to the pocket-full of cocoons pillaged from wild cherry saplings along the way.

Near the head of the dam the water rolled over mud-flat shallows. The countryman was suddenly aware of a half-dozen huge snapping turtles lolling about these flats, enjoying a few more hours of sunlight before burying themselves in the ooze until another Spring rolls around. They hung relaxed just below the surface, their wicked snouts exposed and their baleful eyes watching the intruder's every move.

A band of noisy tree sparrows, down from Canada for the Winter, lured the outdoorsman into the heart of a wild apple tangle which clawed off his cap every few feet and threatened mayhem to all exposed surfaces. A grouse came up with startling thunder of powerful wings. One of the big broad-winged hawks flushed out of the matted shrubbery ahead. Why he should have been moping there is a mystery, unless he was waiting out a case of indigestion from his latest field mouse fricassee.

The countryman finally broke free of the tangles and walked in the open aisles of an adjacent bit of tall woodland. Here in a mucky swale the green fingers of the skunk cabbage were already pointing the way to next March, when the earliest bees and flies will find first pollen inside those smelly hoods. Some small willows edging the brook which drains this swale were host to many of the oddly beautiful pine cone willow galls.

A plump gray squirrel scrambled up a huge white oak and hid himself on a large limb close against the trunk. He was unaware of the fact that the breeze waved his bushy tail over the side like a signal flag. There is a bee colony housed in this

tree, and a few hardy residents were still out taking the air, even though the calendar spoke the language of December. They seemed disgruntled at their overtime chores and raced their motors in a high-octane whine which plainly spelled ill temper.

Old almanacs used to proclaim that the first three days of December set the pattern for the Winter. The countryman noted the balmy beginnings of the present month and anticipated many comfortable weekends rambling through the hill country. Then came the shattering javelin from the icy north, riding hard in the teeth of a swaggering, frigid wind, to plunge the countryside into ice-locked deep frozen misery.

The Weather Maker pays no heed to the homely predictions of the rustic weather seers. No matter what coat is chosen by Uncle Hairy, the caterpillar, nor how the goose bones prophesy, the countryman can always depend on strengthening cold with the first lengthening days.

It is when the Winter closes in, and white storms come whirling across the land, that the countryman walks abroad to marvel at the magic of the snowflakes. One of the supreme achievements of the Great Engineer is His creation of these bits of fleeting perfection.

Snowflakes are designed in the laboratory of the sky, amid surging clouds and up-rushing winds. Water molecules are wafted by the winds toward the swirling storm centers and then upward to the clouds where they mix with the cold currents of the upper air. Here the magic of crystallic law works upon them and they unite and become snowflakes.

All snow is not crystalline. The hard granular pellets which often flee before the wind and the granular snow-stars are actually tiny pieces of clouds assembled and frozen together.

But the snowflakes are made in an infinite variety of forms. Thousands of them, no two exactly alike, have

been photographed and drawn by artists. Some are frail, branch-like tubular forms. Others are solid, like mosaics with exquisite interiors. An occasional flake will be kite-shaped.

As they fall through the clouds towards the earth the snowflakes often grow, building those great downy feathers from Mother Carey's chickens, as they move along the endless assembly line. For a rare adventure in beauty, study the individual snowflakes that fall on your coat sleeve. You cannot help but marvel at the designing skill of the Great Engineer.

There can be no question that the little wild folk of the wayside trails are much better prepared to meet the impact of heavy weather than are the city planners and engineers who blue-print the normal routines in our congested urban areas. They are so used to living dangerously that they take the blizzard and the hip deep snow in stride. Business as usual is the order of the day in the thickets, even though pickings may be lean and the mercury near zero.

Perhaps the only elemental happenstance really feared is the occasional ice storm, which locks up every source of food supply. When one of these storms sheathes the countryside in gleaming armor, then comes tragedy to the thickets. It takes food and still more food to keep the little furred and feathered dynamos going.

When snow lies heavy and food is harder to find, dooryards and barnyards play host to many birds who usually shun these places. We cleaned a wide area and kept a crumb and suet service running during a recent storm. Juncoes and tree sparrows immediately joined the common house sparrows and the chickadees at the feast. I saw the juncoes frequenting the cleared roadways, where the pickings were probably better than in the buried weed patches.

Even a lone brown creeper came close about the house, patrolling the apple and pear trees. The familiar alarm note signaled the presence of a belated killdeer, who was nervously inspecting the edges of an open marshy spot, while the cold snow lay deep all about.

The countryman, ever close to the heart of the outdoors, loves the brilliant night skies and the dazzling sunlight-on-snow mornings of the Christmas season. On Christmas morning after a night of snow the old fields sparkle and glow. The trees are garlanded and every bush wears clustered diamonds glittering in its hair.

The tired old earth seems glad on such a day. The barnyard puts away its somberness and the fence wires run like music on the air. Even the fence posts are lovely regal things in their ermine crowns. And when night's curtain drops and the timeless stars rain through the sky, the countryman in his great faith knows that there will always be a Christmas in the hearts of men everywhere who will but look up.

Fervently the outdoorsman hopes that before another Christmas dawns God may grant that mankind has earned the peace those ageless Christmas stars foretell. Countrymen have been watching the march of the seasons for thousands of years. They have seen the Winter night skies look down in calm brilliance while Hun and Vandal and other pillagers have swept across the face of the land in spates of violence and devastation.

Even though the scorch of human hate has so often seared the earth while mankind has struggled painfully toward universal acceptance of the Christmas credo, the seasons come and go, the sun swings back again from Capricorn, and the countryman knows that time and truth will one day win the field.

. . . *The End.*



Photos by the Author

# *Ways of the Great Pond Mouse*

By Don Shiner

THE muskrat is one of the most interesting rodents found along the lake or pond shores of Pennsylvania. It is to the trapper what the rabbit has long been for the hunter—the game that lures an untold amount of sportsmen afield each year.

Indeed, because of the number harvested annually, it is remarkable how well both muskrat and rabbit are able to hold their own and to be perpetuated to the point, where, for the most part, they are abundant each year. Not only are their numbers



greatly thinned each year by sportsmen, but they are known as the "bread" of the forest, providing food for many wild creatures. The fox, lynx, weasel, mink, owl and hawk capture a tremendous number of both muskrats and rabbits each year and it is nothing short of remarkable how they are able to withstand this heavy loss.

To live a long life, a muskrat must ever be on the alert. Owls and hawks swoop down silently from the air to attack it, foxes prey upon it when it ventures on land, and the otter, mink as well as the large members of the pike family seize it from below as the muskrat paddles its way among the lily pads and along pond shores. However, from this exceptionally large list, the minks place this great mouse in the most precarious position for they are able to follow directly into its home and there make the attack in witness of the other family members. A mink can exterminate a colony of muskrats within a surprisingly short time and frequently does just that!

Everyone who has visited marshy ponds and sluggish moving streams has found evidence of the muskrat. Paths worn smooth are found running from the top of high banks to the water's edge. Here the muskrat slides down into the water, facilitating the transportation of small ears of corn, roots, and plant stems which it has gathered for food. Along the marshy pond, where the water extends back into shallow sloughs, evidence of this great mouse can be found in the form of channels, dug

deeply enough for the 'rat to navigate rapidly. Rarely are these channels dug as do the beavers dig them, rather these paths or channels are worn by the constant traveling of this pond rodent. These channels weave in and around lily pads, cattails and grass beds.

Other signs of this fur bearer can be located near grass beds where large quantities of grass have been pulled and carried in great bunches into the burrows for nesting purposes.

There are other signs of this aquatic mouse to be found. Depending on the shoreline, it is able to make a variety of homes. Ponds that have relatively high banks, extending well above the water level, are used in building a home site. By tunnelling into the embankment, it is able to dig a burrow some eight or more feet at a slight incline, and at the extreme end, a chamber is made where this mouse will raise a family and store a supply of food. Normally, the entrance to these burrows are well below the surface and are frequently concealed; so well in fact, that they often escape the attention of a trapper.

While these den chambers are well above the normal water level, flood time finds these chambers filled with water and the muskrat is forced out. It can then be seen during the day swimming across stream or digging tirelessly into the bank to construct a new shelter.

Where no banks are available, the muskrat builds homes of vegetable matter, mud and sticks. In appearance, these houses are very similar to, but smaller than beaver houses. Work such as repairing these or building new ones takes place in the late summer hence they are in shipshape condition when the wintertide arrives. The mud and debris freezes solid and the houses are impregnable from everything except perhaps a pneumatic hammer.

Unlike the groundhog or bear, the muskrat does not hibernate but is active even when a thick coating of ice freezes across the pond. Pockets of air frequently are trapped beneath the ice and the pond mouse travels from one pocket of air to another as it swims in search of food.

Muskrat trapping has a charm rarely found in other forms of outdoor activity as many sportsmen well know. It holds in store many surprises and it is filled with great hopes and expectations. It is more adventurous than perhaps all the other outdoor sports rolled into one! And trapping muskrats is almost hereditary. Americans have been muskrat trappers for more than two hundred years, since the time when the first settlers stepped foot on this land. The beaver was the animal that was sought after, but because the muskrat has such fine fur and because it is found living in perfect harmony with the beavers within the same pond, it too was trapped extensively. Even today many sportsmen take delight in searching the meadows and river shores during the twelve months of the year for signs of muskrats. Some may carry a fishing rod with them and even do some angling, for often there are trout, catfish and pickerel found in the same waters inhabited by muskrats. Perhaps they seek these places to avoid visiting the crowded valley trout streams, but for the most part, the underlying reason is to learn the whereabouts of these great mice so they can return again in winter, armed with a bundle of traps.

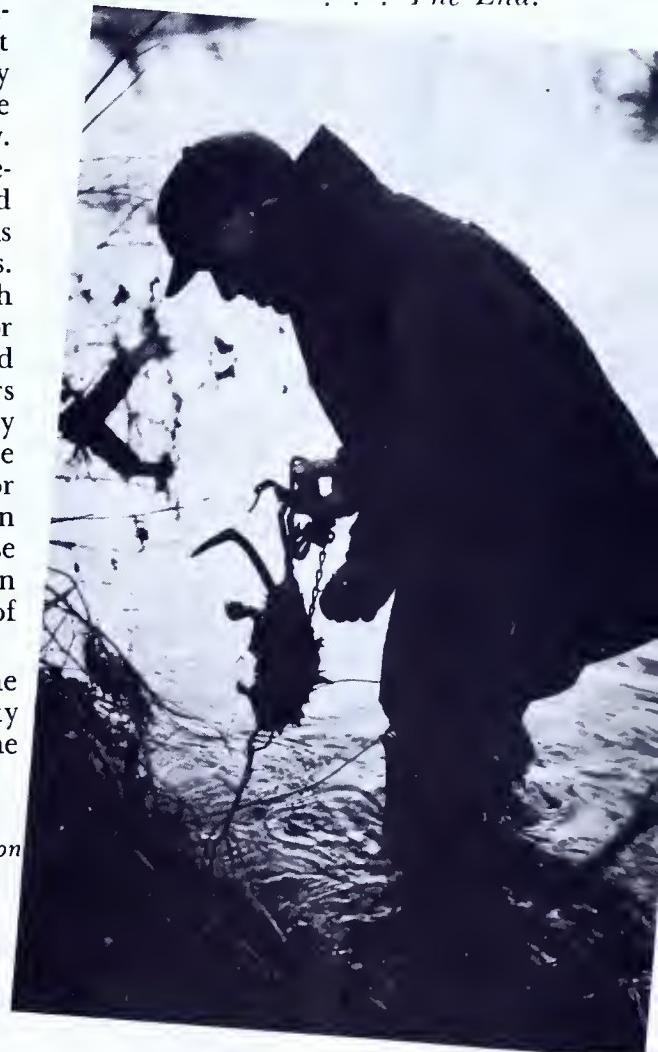
Of all the fur bearing animals, the muskrat appeals to the great majority of outdoorsmen and for many, the

opening of muskrat season is the highlight of the year. They may lay extensive traplines to include mink, coon, and fox, but it is rare that these lines do not come near a pond or a stream and a few sets made for muskrat.

This popular fur bearer rates this high interest for they are found throughout Pennsylvania and there is usually a big demand for the pelts. The fur makes up into exceedingly beautiful coats and some are dyed and sold under the various names of River Mink and Hudson Seal as well as others.

Many thousands of these animals are trapped each year and they provide a form of income to many rural families. Yes, the muskrat is definitely needed in the fields and streams of Pennsylvania.

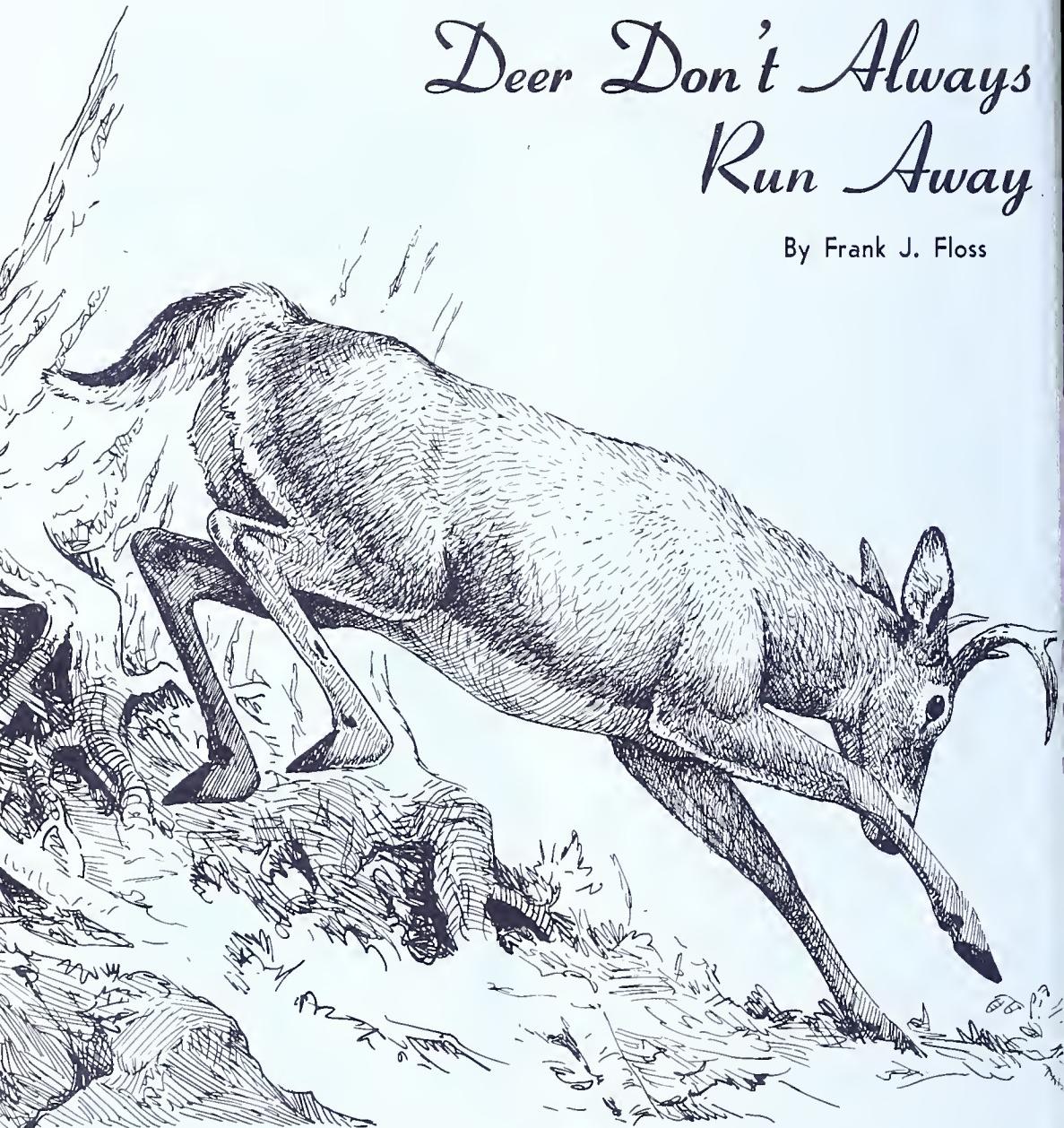
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*For many the opening of muskrat season is the highlight of the year.*

# *Deer Don't Always Run Away*

By Frank J. Floss



ALTHOUGH most deer are credited with following a set pattern of behavior, there are times when, due to the pressure of being hunted, they react in an entirely unexpected manner. Certainly they often explode the theory that they are creatures of habit and seldom do anything on their own initiative.

Most hunters soon learn what is to be expected of a deer and adapt their hunting methods to the normal

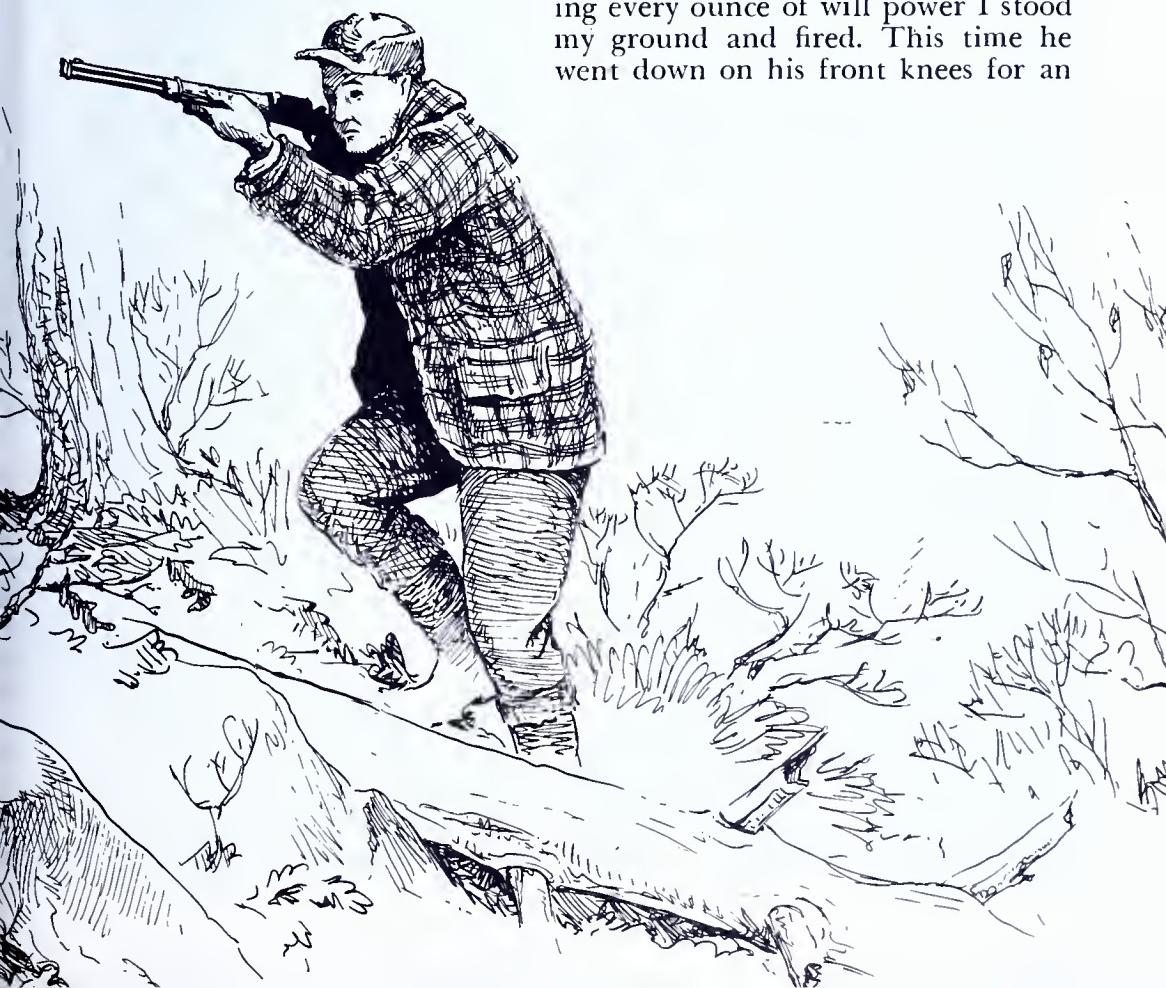
ways of this wild wanderer, ways that have in some mysterious manner been taught or inherited from the animal's ancestors down from the dawn of deer time. For instance, the normal whitetail that hasn't been shot at or frightened in some other way will usually make a U-turn before it beds down so that it can watch its back-trail for the approach of an enemy, thus giving it time for an escape to safety. But take a deer that has just

ucked a fusilade of flying lead, has been chased hither and yon by unters and you'll find a bundle of erves and muscles as unpredictable s a pine seed on forest winds.

This I know from experience, for I've hunted a lot of deer during the last twenty years and have my share of trophies to show for the many hours spent in search of deer. Each of these hunts I have enjoyed but to be truthful, there were several deer with no respect for habit that made me regret the shots I took at them. These more than evened up the score for all the easy ones I bagged. In fact there were a few anguish-filled seconds which seemed to last a lifetime where I found out what it is like to be the attacked instead of the attacker. Death in the form of sharp-pointed hoofs and blunt tines has passed me so close that their wind fanned my cheek.

The first such incident took place one morning after I spotted a white-tail deer browsing on an aspen tree, some 50 yards or so above me on the slope of a Pennsylvania mountain.

When I saw the deer rearing up to feed on the lower branches of the tree, I quickly dropped down on one knee and watched him for a few minutes to make sure he was a legal buck. When I got a good look at his antlers and was sure he was legal, I took a shot at him. Then things began to happen that you don't read about in books. Instead of going down or running away as I had expected, this deer turned and started down the mountainside right for me. Through force of habit I levered another cartridge in the chamber and held the rifle on him as he bore down on me. For a second I was in a sort of a trance. I wanted to run and pull the trigger at the same time but couldn't do either. But I knew I didn't have a chance if I ran. Exerting every ounce of will power I stood my ground and fired. This time he went down on his front knees for an



instant, then scrambled back on all fours again still coming at me. At this point he looked as big as a moose and twice as fierce. I shot again and again. At the last shot he was on top of me, I tried to jump out of his way, but didn't make it. He hit me with a thump that knocked the rifle out of my hands and sent me sprawling.

I skidded down the mountainside twenty feet or so before I managed to scramble to my feet, and looked, though somewhat dazed, to see where the deer was. He was laying about fifty feet from me. He looked dead, but not being sure I hastily retrieved my rifle and reloaded it, then sat down where I could watch him and give my nerves a rest. At the end of fifteen minutes he hadn't moved so I decided he was down for good, and went over to look my attacker over. On examining him I found that one of my last shots had knocked one antler off, and went on into the brain killing him instantly. That lucky shot probably saved my life. But to this day I don't know how I came to hit him in the head, for all the time I was shooting, I was aiming at his chest. Who said they always run away?

Another time while hunting in the Beechwood section of Cameron County I had just left a hunting companion of mine and started up a trail that led to a good deer crossing, when by chance I happened to look over my shoulder and got the surprise of my life. For there, not over thirty-yards behind me, was a buck deer, nose to the ground, following me up the trail. My first thought was that he was wounded and was about to attack me. But when I stopped and brought my rifle up to my shoulder, he threw up his head, took one surprised look at me, and leaped into the brush along the trail. I shot at his rump as he went into the brush, and when I walked down to where I had seen him last, I found

him stretched out. My bullet had entered just below the tail and gone on up into his chest. I looked him over for other bullet wounds, but he only had that one shot in him. Why was he trailing me? I don't know. Probably just wasn't afraid of me, like he was supposed to be.

Years later I was hunting down in the Texas panhandle along an old trail about halfway up the side of a mountain. My companion thought he saw something move in the valley below us. So we sat down on an old stump, trained our glasses on the spot and picked out a buck with a nice set of antlers just walking along.

He was at least three hundred yards below us, so I told Al to open up on him while I watched through the glasses. Then if he succeeded in downing him, I would know just where the deer was and could guide him to it. However, this was a needless gesture on my part. When Al's first shot echoed across the valley, the buck turned and started up the mountainside on a bee-line for the stump I was sitting on. He came running up the mountainside and everytime he hit an open spot in the brush, Al shot at him. But he never turned. He kept coming straight for us and got to within twenty-five yards of us before Al got a good shot at him and knocked him down for keeps. Why didn't he run away? He had miles of safety ahead of him.

Doe deer sometimes do the unexpected too. As I walked around a small pine tree one day I came face to face with a doe. It stopped and so did I. We stood and stared at each other for several minutes. Then I threw up my arms expecting to see her about break a leg in her haste to get away. However, this doe had other ideas, for she just snorted and started to paw the ground with one front foot. Right there I decided she wasn't going to make friends or give ground, so I backed up and started around the other side of the



PGC Photo

*Shy, timid creature? Well, the author of this article relates a few instances that might change your mind.*

tree. But when I got there, she was waiting on me. I thought to myself I'm not going to let a little doe deer bulldoze me, and walked right towards her. And this time she really went into action. Snorting, she reared up on her hind legs and pawed the air with her front legs. In that instant I recalled the words of the man who said, "Discretion was the better part of valor," and backed out of the woods in another direction. Again I had exposed myself to needless danger because I believed doe deer to be timid.

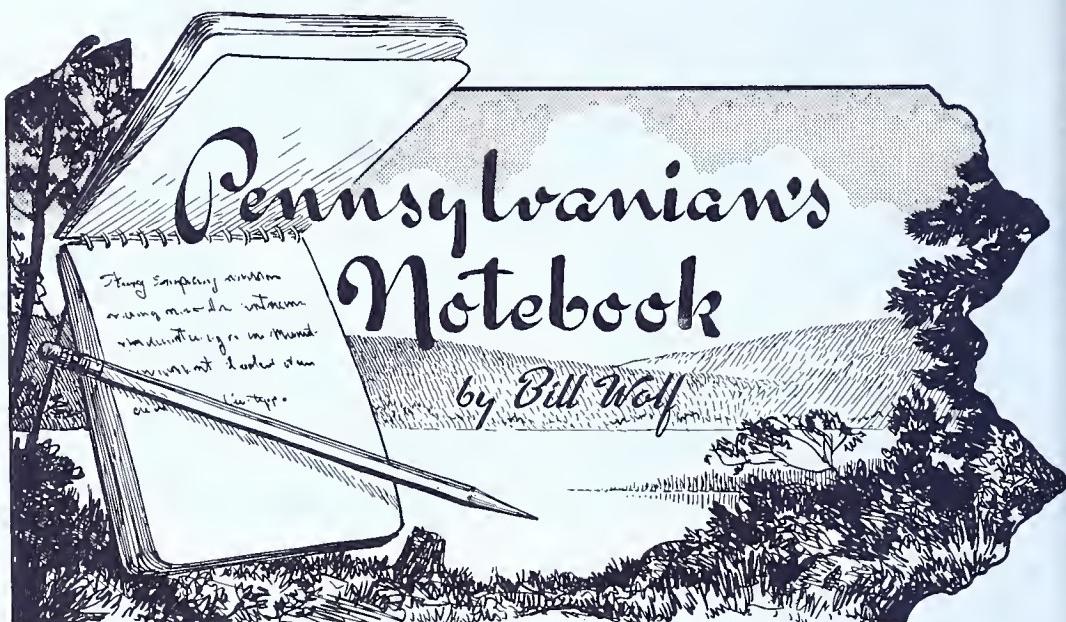
They tell us, too, that a wounded deer will run away and try to escape the hunter. But don't ever depend on them doing that, for every once in a while you'll run into one that will not run very far. And woe unto you if you don't drop him in his tracks when he decides to charge you.

Not too long ago, I was trailing a wounded buck in about six inches of snow, trying to get in a finishing shot. But the jackpine was so thick all I ever got was a glimpse of him as he crossed the small openings among the pines too quick for me to get a shot. He knew that I was trailing him and he would wait until I got just so close; then he would take off again. He was bleeding very bad

and every time he stopped to rest, there would be a small pool of blood beside his trail. I expected to find him stretched out at every turn and was unprepared for the trick he pulled. I just happened to look up from his tracks in the snow as I topped a small rise. There he was, coming right back on his own tracks toward me, as fast as he could run. Needless to say I went into action, but fast, and dropped him on the spot. Then I began to wonder if I had shot my crippled deer or another one that just happened to come along. However, when I rolled him over I found two bullet holes in him and was satisfied that I had bagged the deer I had wounded.

Believe me when I say, "Deer Don't Always Run Away," and never trust a deer to do what you think it will do during the hunting season. For under the pressure of heavy hunting they are wild and temperamental, seldom sticking to the habits that are normal at other times of the year.

. . . *The End.*



### City Jungles

At present I am living in a heavily builtup section, a typical Pennsylvania urban community of the less fortunate kind where houses were jammed together without thought for parks or playgrounds. The only nearby open spaces are a triangular plot of ground with a few trees and some struggling grass, usually called the "park," a long vacant lot filled principally with weeds, and a tract of ground and some trees around an industrial building. There are some trees on the streets, of course, usually buttonwoods, or sycamores. It is a most unlikely place to find wildlife of any sort, a person would say. I am not criticizing it, but it is simply a place where adults can live in comfort and conveniently close to anything they need, while children have no place to play.

However, a number of things have shown me that it is not entirely devoid of small touches of nature, and the persons who feels that they are hopelessly cut off from the "outdoors" when confined to a large city are wrong.

Lately, I have noticed an influx of small boys, armed with long-handled nets and obviously going after butterflies as I once did. I watched for a while and they all headed for the big vacant lot. There they chased butterflies and caught quite a few. Perhaps there is a local scoutmaster with an interest in such things, or maybe they do it as part of their school work. I wouldn't know, but it's reassuring to know that butterflies don't avoid such a "civilized" place.

Curiosity led me to walk through the weeds that are nearly shoulder high in the vacant lot, and the amount of insect life was amazing. Crickets, grasshoppers, katydids, moths and butterflies, and all kinds of small fry fled before my approach just as they do in the country. Spiders spun their webs, and on the ground there were many kinds of beetles and bugs. Some huge stalks of Canadian thistle were as tall as I am, there were big burdock stalks, both kinds of plantain, daisies and other wild flowers, all kinds of grasses and other plants. On the surface it is just a weed patch. On close examination it

ecomes a bit of the outdoors in the ty.

The other day I saw a gray squirrel in a sycamore across the street. Nothing unusual about seeing a squirrel in a Pennsylvania city, but it is the first I ever saw in my section. Early each morning during spring and summer I heard two crows passing over, and sometimes heard them in the evening coming back from where they had been foraging for food. They must live somewhere near here. City rows, so to speak. A pair of cardinals are around all year, and the male flies to the top of the one of the few oak trees in the vicinity to sing his song.

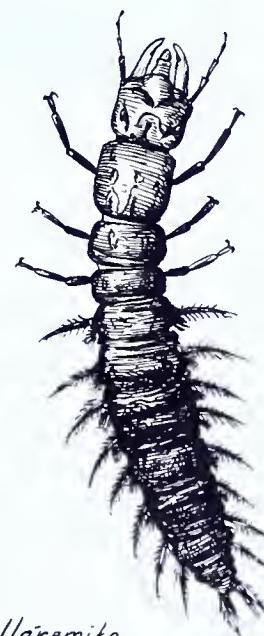
One evening a neighbor who had been sitting outside to enjoy the bit of coolness that nightfall brings in summer came rushing up to my place. "What's that?" he asked, holding out a huge insect. "A dobson fly!" I replied. He knew what it was, because he came from upstate and fished many trout streams where dobson flies can be seen, but he just wanted to make sure he wasn't dreaming. He saw it fly into a brick wall and fall near his feet. These flies hatch from hellgrammites in the streams, and this one shouldn't have been there at all. The only nearby water is a stinking creek in which insect life is impossible because of the pollution.

Another night, I was sitting beside a screened window when a Luna moth fluttered against the screening. Its pale green body with the beautifully curved wings was unmarred, so it must have hatched quite recently from a cocoon miraculously spun where a cocoon shouldn't have been, smack in the middle of a desert of houses. There are field mice around here as well as house mice, and I heard that a skunk was seen some blocks up the street a couple of years ago.

Somehow, this evidence of nature's persistence, in the face of adverse factors created by man's penchant for covering the green earth with houses,

cement and asphalt in building cities, gives one a feeling of impermanence. The flowers that swiftly covered the scars left by bombings of European cities in the last World War are further evidence that we hold our cities against the encroaching forces of nature solely on a day-to-day lease basis. The minute we abandon a plot of city ground, a sidewalk, a street paving or even a building, nature moves her forces in. I know of one large anthill upstate that has changed less in outward appearance over a period of ten years than a city block would in one month's time after its human inhabitants moved out and left it to nature.

The trees, especially, are always waiting to take over. Even in our midst, they send down roots to destroy our sewage systems. Their seeds fall in piles of dust collected on rooftops and take root there. They start growing in crevices in bricks and stone walls, and in the cracks that appear in concrete walks and streets. The city man does not have to travel far to see nature at work.



Hellgramite



### Buck Fever

Each year when we go deer hunting we hear the same old stories, and I'm beginning to wonder about some of them. I have heard from many persons—and have read many times—the tale about the hunter who got buck fever and went through all the motions of emptying his rifle at a deer, all the motions, that is, except actually firing a cartridge. In his excitement, he forgot to pull the trigger and simply ejected the cartridges on the ground. However, it always has happened to "somebody up in Potter county," or to a "friend of a man I know," and never to anyone easily identified or near at hand. Actually, I don't know a single hunter who has seen it really happen to someone in his party or near him. I do not say it couldn't happen, but it sounds like one of those apocryphal tales that just keep going around and around.

There's the story, too, of the Pennsylvania hunter who emptied his gun at a deer, and, then, ran after the deer in his excitement and threw his rifle at it. It's an understandable gesture, but I've heard it wherever I have gone, in many states as well as Pennsylvania, and suspect that it might have happened somewhere sometime, but is not the everyday occurrence its frequent repetition would have us believe it is.

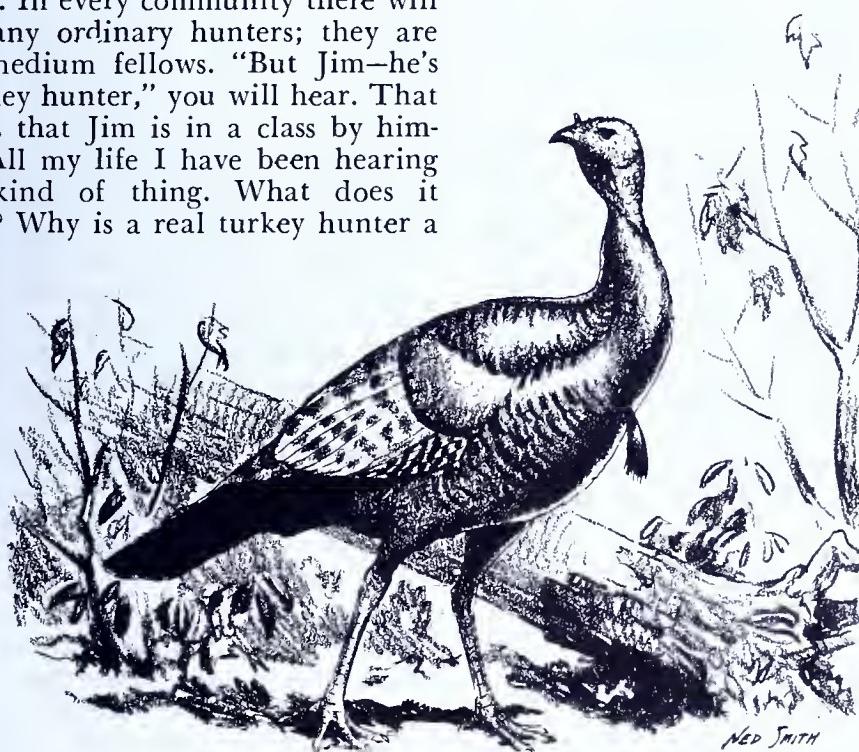
I do know authentic and firsthand cases of men too shaky to fire at a deer, and I have seen some queer instances of extraordinary behavior under the stress of excitement; but does anyone actually *know* a deer hunter who emptied his rifle without firing a cartridge, or who threw his rifle at a deer?

. . . *The End.*

# But He is a Turkey Hunter

By Archibald Rutledge

MAKE no mistake about this: some men are mere hunters; others are turkey hunters. These two strains of sportsmen are radically different. In every community there will be many ordinary hunters; they are just medium fellows. "But Jim—he's turkey hunter," you will hear. That means that Jim is in a class by himself. All my life I have been hearing his kind of thing. What does it mean? Why is a real turkey hunter a

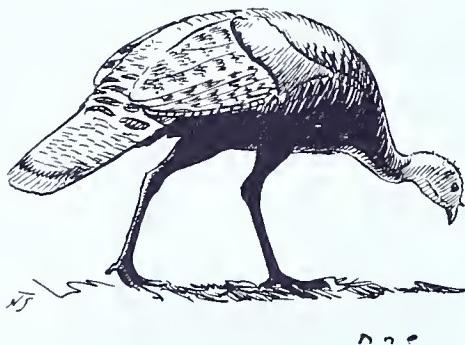


*ara avis?* Well, as the poet says: "Listen, my children, and you shall hear." There's a real answer, and we may be able to give it.

Near my South Carolina plantation there are several hunting clubs. On their great preserves they have deer, turkeys, ducks, and quail. As a rule the members take small interest in deer hunting; they are wild about ducks and quail; and they appear indifferent to turkeys. I asked some of these men why they neglected the Great Bird. The consensus of their replies was this, to put it

plainly: the work involved is too hard and too uncertain. The reward is too contingent on patience, and on an almost uncanny ability in woodcraft that the average hunter simply does not possess.

That it is difficult and uncertain is a fact; but, as is the case with all arts, it can be mastered, and the dividends paid are worth all the time and effort spent, all the failure and disappointment. As is the case with most other things in life, the pleasure and sport derived are in proportion to the energy expended, but more espe-



cially to the degree of mental craft employed.

I guess the best way to go about this business is simply to tell of some of the turkey hunters I have known—the real ones; the men who, coming on a gobbler's track or any other sign of wildwood majesty, would forsake all else and follow him. A true turkey hunter will abandon (temporarily) wife, home, babies, his job, even his neighbor's wife—just for a chance at an old bearded man of the wilderness. He's just that way, and that is the way he will always be.

Tyler Somerset was a turkey hunter. As I remember him, even in his prime, he had a lot of boyish characteristics: slight, keen, active and tireless, he had in the woods what I call a melting quality. Now I'm not referring to the oomph of Hollywood. I mean that now you would see him, and now you wouldn't. Even in comparatively open woods he could fade out. Every step he took was a wary one. He could keep long silences. I have been with him for more than two hours at a time without having him speak a word. He was oblivious to such trivialities as the weather and the passage of time. Miles from home, in the most desolate and god-forsaken swamp, the coming of eerie and obliterating darkness meant nothing to him. He was perhaps the best listener I ever knew; and he could

wait. Now, other hunters can wait but Tyler waited differently. I can see him now, as alert as a just awakened sentry who has been tipped off that an officer is approaching; his head a little on one side, his blue eyes glinting—looking, listening actively waiting for his True Love. He has that rare sportsman's trait—the ability to outwit a wild turkey.

I myself at times have been a hunter of turkeys, and I know what it takes; among other things it requires boundless persistence, endless patience, and the ability to absorb more than a normal degree of disappointment. I might add that an incurable turkey hunter must either discipline his wife to his vagaries, or else suffer a good many domestic shocks. When a man does not come home until several hours after dark with nothing to show for all his time and effort, his lady's attitude may faintly suggest that he is something that might be sold to a circus. Despite their reputation for sentiment, women (especially wives) are very practical. They love game on the table, and they love a man who can put it there.

Successful hunting this great bird calls for an almost perfect knowledge of its habits, and requires also a high degree of individual initiative. As a rule, the deeper you go into the wilderness, the better your chance of success will be. Nor is the hunting standardized as is the case with practically all other game. It takes a lot of personal scheming and hard work. For it is to be remembered that this bird has legs that enable it to distance a good horse; he has wings that can carry him a mile or more out of danger; his eyes and ears are among the most perfect in all nature; his behavior is as unpredictable as his mentality is high. As a general rule, if you move, he will see you and hear you long before you are aware of his presence. "Not many hunters can kill a turkey," as my old friend

Phineas McConnor says. And that remark makes you realize the difference between the ordinary variety of hunter and the turkey-loving tribe.

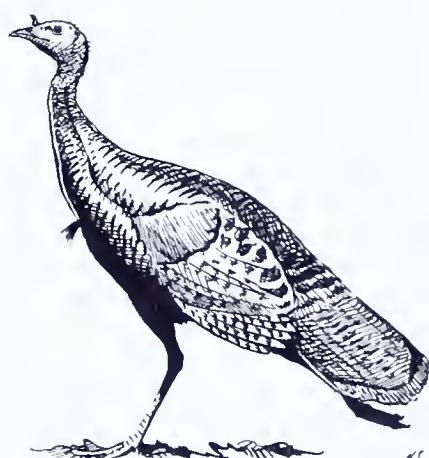
Not far from me, but in the gross wilderness, lives Phineas, a matchless Negro woodsman. He is small in stature and physically he is frail. But he is one of the best turkey hunters I know. When I ask him why he has such luck, he says, "I outquiets them." And then I know it is not luck at all, but rather a kind of wildwood genius: a capacity to wait for hours without motion and without sound. When I walk the woods with this lithe and wary Negro, I feel clumsy. He goes through brush like a cat crossing a carpet.

I can see Phineas now, almost creeping ahead of me down the old pineland road, his eyes scanning the apparently undisturbed pine straw. Suddenly he stops. "Ah, ha!" he whispers, pointing out to me a piece of bark that has just been turned over. "I think a turkey did that," he says.

I am unconvinced until we come to a damp sandy place in the road. Then, in a perfect ecstasy, Phineas spreads wide the fingers of either hand in imitation of the huge turkey-tracks we see in the sand. The delight of Phineas is such that one might imagine that the old bearded man were already his. In a way, he is; for woe to the wild turkey upon whose track a real turkey hunter comes! With a passionate persistence he will follow that bird—for hours, for days, and sometimes for weeks, untiring, undismayed by apparent failure, and inventive in schemes of ambush and in other forms of waylaying. Through all his wilderness windings and turnings he will be followed as if by Fate itself. A real turkey hunter is relentless on the trail of a gobbler. He never seems to abandon the wary pursuit.

Of course, of all wild game, the turkey is perhaps the most difficult to stay with. If he ever discovers that you are after him, he will literally quit the country—almost quit the world. And, unlike most other game, he does not persist in having regular haunts. For that reason, while I can always promise a man a shot at a buck, I make no such promises about a gobbler. He is here today; tomorrow he may be ten miles away. Often, for no other more apparent reason than a love of travel, he will fly across rivers and lakes, pass from one mountain to another, and traverse huge tracts of country. Nor do I believe there is another bird in the world that uses both his legs and his wings to carry him over so great distances. Compared to the travels of a wild turkey, the grouse, quail, pheasant, and wild duck hardly go anywhere on their feet. When he is doing nothing but merely ranging for feed, a wild turkey may travel several miles a day; and when he is getting out of country he has become suspicious of, he may go even farther.

Turkeys are subject to vagaries; they *get notions*; and with apparent purpose, but for no discoverable reason, will suddenly quit good quiet territory and wander for miles. You cannot count on turkeys. They some-



times act as if they had something on their minds that not even a turkey hunter can fathom, and perhaps they themselves don't quite know why they act as they do. And no man can be sure, even by means of what he calls perfect planning, of coming up with these big birds which, either from secret wisdom or from aberration, occasionally act as if they were plain goofy.

A hunter's success with game is usually in proportion to the game's wariness, and to his knowledge of what moves to make in this life-and-death chess game of the wilds. He may bring in twenty rabbits for every single ruffed grouse; ten grouse for every wild turkey. For this premier game bird of the world has eyesight second to none other in nature, and hearing as acute as any we know, and a mind of rare intelligence. He walks warily, with wild and springy grace, as if he were forever poised for instant escape by running or by flight. He knows all the dangers, and he is qualified by nature to escape them. He can stand watchfully still for a long time.

When I lived in the beautiful Cumberland Valley of Pennsylvania, I found there, as I found elsewhere, that a real turkey hunter is one who really stands quite apart from the ordinary lovers of hunting. In the village in which I lived, there were perhaps thirty men who hunted quail, rabbits, grouse, squirrels; perhaps half that number hunted deer. "But Seth," I was told,—"he's a turkey hunter."

I cultivated the acquaintance of Seth, and I hunted turkeys with him in the wilds of Path Valley, clear up to the Juniata; in Bear Valley, on Sidelining Hill, in the Big Cove, and on Two-Top Mountain. We even got into West Virginia on a hint from a friendly mountaineer that there were turkeys at a place called Seldom Seen.

As I had regular work, I always had to get home by night. But Seth's

regular work was to kill a gobbler. I have known him to spend the night alone in those wild mountains just because he had come upon some turkey scratchings that looked not over a day old.

"To kill a gobbler," he used to tell me, "you got to see him first; and after you see him first, you mustn't let him see you at all. A wild turkey that sees a man is a turkey that gets away."

Seth had a good wife. She understood him. "I like him the way he is," she once said to me with shy pride.

She had a right to be proud; for during all the years that I knew him, he got his gobbler every season.

Seth knew much more than I did about hunting wild turkeys in the Pennsylvania Mountains. Following his advice, I enjoyed some grand sport in that matchless country. His advice was simple: "Stay high on a ridge, where you can look down both sides; let them come up to you; and outwait them."

Yet for all his smartness, for all his equipment for safety, the wild turkey meets more than his match in certain individuals of the outdoor fraternity known as turkey-hunters. I admire a good turkey-hunter chiefly because such a man displays qualities that we usually associate with pioneer America—patience, enthusiasm, acute woodcraft, game sense, and a quiet hardihood undaunted by rain, by cold, by long tough miles, by disappointment; not turned from his fine grim purpose even by feminine sarcasms from his Lady, who may pour it on him for neglecting her and all else in life for what she, in her resentment, terms "a poor miserable bird in a godforsaken mountain." But if he happens to bring home one of these bronzed kings of the wilderness, she has ways to make his long and arduous campaign seem worthwhile.

. . . *The End*

# McKean County

## Twenty-Eighth In A Series

*Note: This center sheet can be removed, if desired, by loosening the two staples.*

### Land Area

Located in north central Pennsylvania, McKean County contains 638,080 acres, of which 555,844 acres are forested. Publicly-owned land includes 158,127 acres, 20,634 in State Game Lands.

### Topography

The general surface of the county is elevated, some points being higher than 2,000 feet. The streams are mainly tributaries of the Allegheny River which here flows north into New York State.

### Transportation

Railroad transportation is furnished by the Pennsylvania, the Baltimore & Ohio, the Pittsburgh, Shawmut & Northern and the Erie lines. The Roosevelt Highway (U. S. 6), the Buffalo-Pittsburgh Highway (U. S. 219) and other important routes traverse the county, which has 381 miles of improved State highways.

### District Game Protectors

District Game Protector William J. Carpenter, R. D. 1, Kinzua, has jurisdiction over Corydon, Hamilton, Wetmore, Foster, Bradford and Lafayette townships.

District Game Protector William H. Shirey, R. D. 1, Smethport, has jurisdiction over Keating, Hamlin, Sergeant, and Norwich townships.

District Game Protector Cecil D. Hancock, 112 Francis Ave., Port Allegany, has jurisdiction over Otto, Eldred, Ceres, Annin and Liberty townships.

### Fish Warden

Wilbur Williams, R. D. 1, Smethport.

### Agriculture

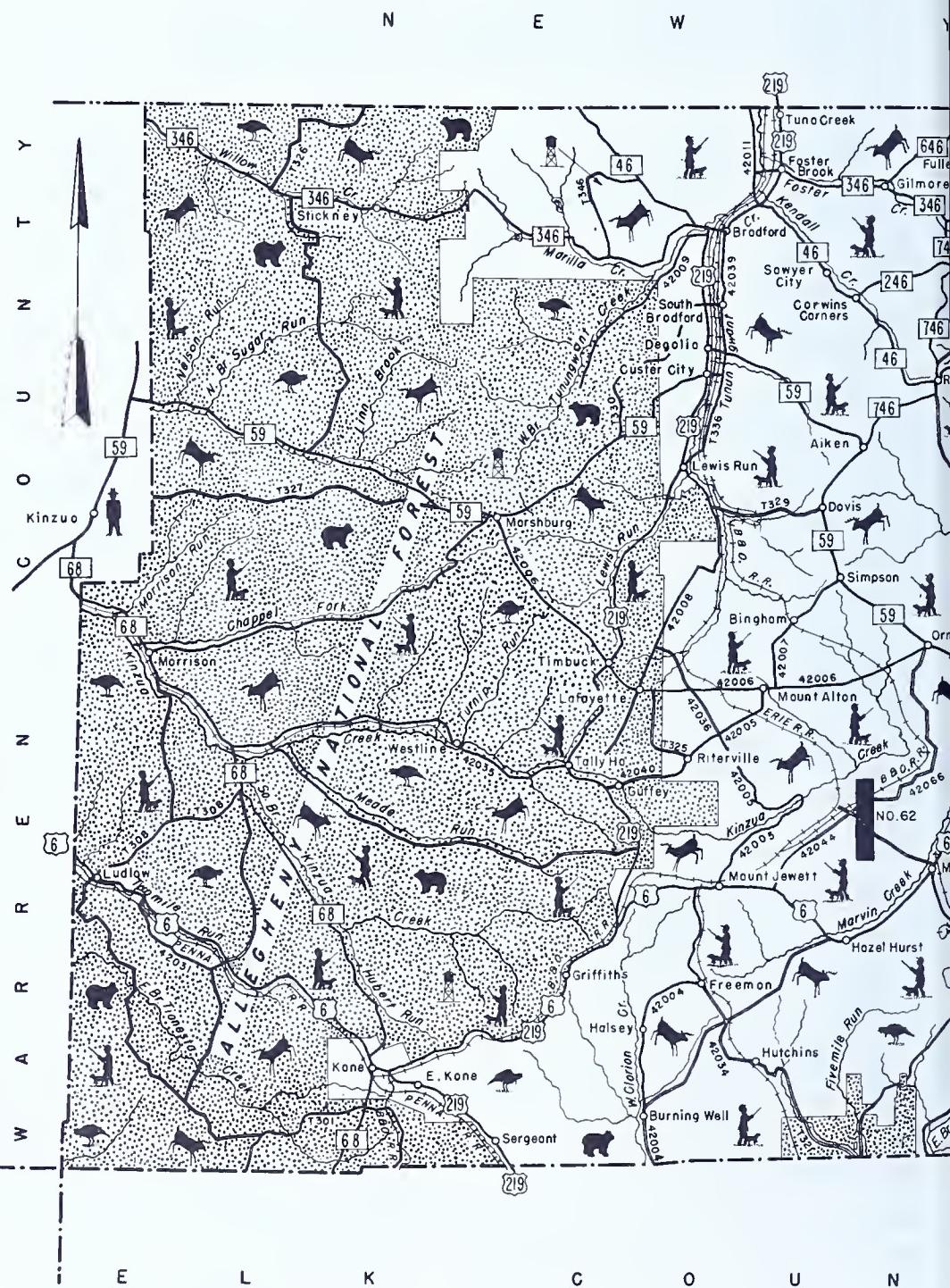
The county is most notable for dairying and livestock though it is dotted with numerous small farms which grow a diversified line of crops.

### Industry

For many years McKean County has led the State in the production of oil and natural gas, these industries having had a most important part in the county's development. The Bradford oil pool is the great mineral resource of the county, and natural gas is produced in several pools. The Music Mountain oil pool in Lafayette Township has been developed since a "wildcat" well struck oil there in August, 1937. One of the nation's oldest and largest manufacturers of wood toys is located at Kane and the county's large forest acreage also furnishes the basis for several chemical industries. Powder and explosives, glass and clay products are made here but the chief products, however, are lubricating oils and greases, gasoline and oil well supplies.

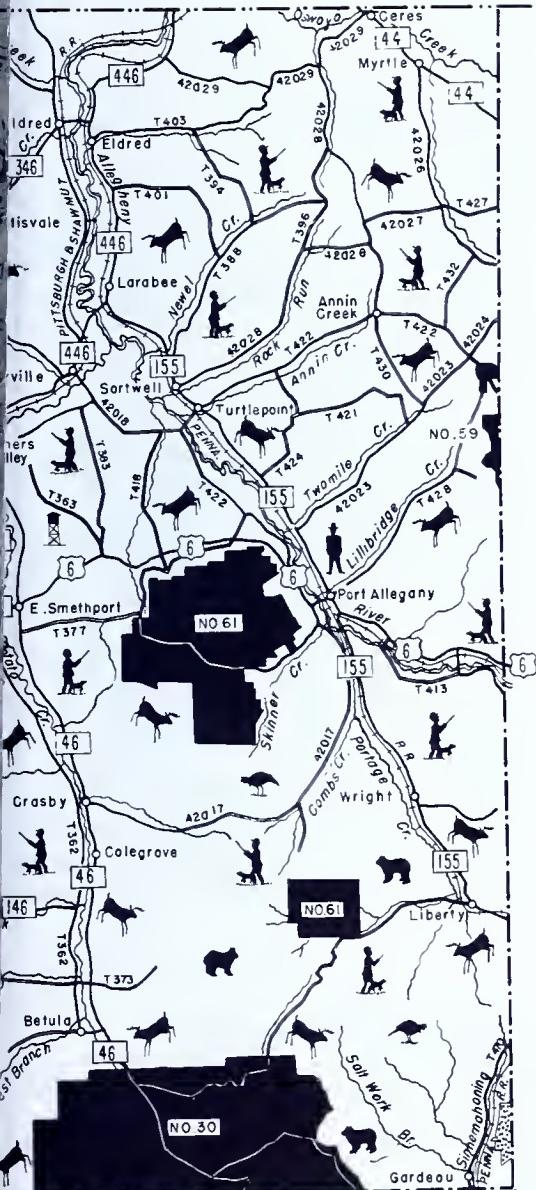
### Historic

McKean, sometimes called the "Governor's County" because of the interest taken in its formation by Governor Thomas McKean whose name the county bears, was one of



... KEY ...

R K



 .... County Seat.  
 .... State Forest Fire Observation Tower.  
 .... Game Protector's Headquarters.  
 .... Deer Hunting.  
 .... Turkey Hunting.  
 Small Game Hunting.  
 ....  
 ....  
 ....  
 ....  
 .... Stream.  
 .... State Game Land.  
 .... State & National Forest.  
 .... Pennsylvania Route Number.  
 .... U.S. Highway Route Number.  
 42023 .... Legislative Route Number.  
 .... Township Route. (T-377)



PENNSYLVANIA  
GAME COMMISSION  
M<sup>c</sup> KEAN  
COUNTY  
PENNSYLVANIA

0 1 2  
SCALE IN MILES

the last frontier counties in Pennsylvania. When formed in 1804, the area was still a complete wilderness. Earlier these lands were part of "Seneca Land," hunting grounds for the Iroquois. McKean county's settlers came from a variety of places. Some came down from New England and New York, often along the valley of the Allegheny River. Others came up the Susquehanna and journeyed overland by way of the famous Jersey Shore and Coudersport Turnpike or the Portage route of the Indians to Canoe Place (now Port Allegany) by way of Sinnemahoning creek. The military spirit of the region ran high in Civil War days and under the command of the famous Major General Thomas L. Kane, one of McKean's greatest heroes, the Bucktail Regiment was recruited from citizens of the county and its neighbors who went on to distinction on numerous battlefields.

Following the War, McKean county experienced a boom resulting from the first commercial development of oil and gas in 1876-78. The county shortly became a leader in the oil industry and today is the largest single producer of world renowned Pennsylvania oil.

#### **Recreation—Fishing**

Fishable waters (name of stream or lake, fish stocked, location and

length or area of stocked waters) include: Bell Run, brook trout, Shinglehouse, 2 miles; West Clarion Creek, brook trout, Wilcox, 5 miles; Five Mile Run, brook trout, Wilcox, 2 miles; Fuller Brook, brook trout, Kushequa, 2 miles; Kinzua Creek, brook trout, Kushequa, 5 miles; Kushequa Pond, rainbow trout, Kushequa, 13 acres; Marvin Creek brown trout, Smethport, 10 miles; Portage Creek, brown and rainbow trout, Port Allegany, 8 miles; Potato Creek, brown trout, Crosby, 7 miles; Seven Mile Run, brook trout, Wilcox, 5 miles; Oswayo Creek, black bass, Shinglehouse, 6 miles.

#### **Recreation—Hunting**

McKean county affords some of the best bear and deer hunting found anywhere in Pennsylvania, the big game bag annually being ranked among the top five counties. The county also provides excellent wild turkey hunting.

State Game Lands include Number 30, totalling over 11,500 acres, located near Betula; Number 61, comprising 8,142 acres, located near Liberty, and Number 62, totaling over 500 acres, located near Port Allegany. The Allegheny National Forest covers almost the entire western half of the county.

. . . *The End*



# What Happened To Your Deer?

By Stanley E. Forbes\*

ARE you wondering why you didn't get a deer this year? Have you thought that the cause might not be in your lack of ability, proper equipment, or just plain luck? Perhaps you are right. Certainly, being in the right place at the right time is important, but perhaps there was a deer that should have been yours except—something happened to that deer before the season opened.

To the average sportsman, the life of a deer may seem relatively simple; but for the deer itself, life may be very complicated. For instance—you no doubt have heard various Life Insurance Companies make statements that for every pound you are overweight your life expectancy is shortened by one year. How do you become overweight? Mainly by eating an abundance of good food. Everyone likes to indulge in good food; so do deer. But what penalty is theirs? Not obesity! Last year, 2,077 deer lost their lives abruptly because they were indulging in an abundance of good food in the form of farm crops! At the other extreme, 4,479 deer died of malnutrition because they could not find enough normal food to enable them to endure the rigors of winter.

Let's look at another aspect of this "easy" life. Can the wild animal adapt itself to the modern machine age where increased speed is the criterion of advancement? During 1951, 37,500 people died in highway accidents throughout the nation; of these, 9,100 were pedestrians. Not willing to be outdone by mere humans, 3,332 deer in Pennsylvania



alone pitted their wisdom and agility against the machine and subsequently paid the supreme sacrifice for failing to dodge at the right time. This represents approximately five percent of the total number of deer killed in this state (including legal open seasons) during the past year. When you're on the highways, remember, deer frequently jump into—not away from—glaring lights; and your life is in jeopardy as well as theirs. GIVE WILDLIFE A BRAKE!

What is your occupation? Perhaps you are a meter-reader, a milkman, a mailman, or a door-to-door salesman. If so, did you enjoy meeting that "harmless" dog whose owner cautioned "His bark is worse than his bite?" What was the outcome of that meeting? There's not much doubt but what you were luckier than the many deer that were harangued by the bark and succumbed to the bite of harmless dogs whose owners were careless, indifferent, or underestimated the capabilities of their pets. Few sights are more heart

\*Leader, White-tailed Deer Investigation.

rending than to see a deer pulled down and partially eaten while still alive by vicious dogs. More than 100 cases of dog depredations were found and reported last year. Many, many more went unknown.

As if life were not already complex enough, off the highways the deer have to cope with increased farm mechanization. Fawns are regularly killed by tractor-drawn mowers. Trains, and even metropolitan subways, account for many deer. The old adage "Look both ways before crossing" is becoming obsolete; it is necessary to add a third dimension—"up." A recent report reveals that a deer was killed by a landing aircraft. Falling into ditches or other excavations, falling from cliffs or bridges, becoming wedged between trees, locking antlers while fighting, hitting wire fences, being trapped by fire, and last but not least—poaching—accounted for a total of 944 more fatalities listed under "Miscellaneous."

It must be remembered that these figures represent only the recorded loss. How many deer are struck by cars and crawl off and die and are never found except as bleached bones? How many are shot for crop damage and escape to die later? How many die of starvation but are not found when the spring tally is made? And how many are killed and eaten by poachers who are never caught in the act? How many more are killed by dogs or die accidentally without having a recorded case history. The total loss must be far greater than the impressive list just given, but it is impossible to determine the exact number.

Of the thousands that did survive these obstacles to extended life, 72,534 ran into the line of sight of some lucky hunter during the legal open seasons—but they furnished much recreation and excitement in doing so.

What does all this add up to? Just this. You hunters took home less

than 87 per cent of the deer killed in Pennsylvania last year, only 7 out of every 8 that were killed. If the total out-of-season loss were known perhaps the legal kill would be no more than 60 to 70 per cent.

## WAS YOUR DEER KILLED HERE?

### 1951 Deer Kill

Legal antlered .....	34,582
Legal antlerless .....	37,952

### 87% of TOTAL KILL

#### OR HERE?

Vehicles .....	3,332
Crop Damage .....	2,077
Starvation .....	4,479
Miscellaneous .....	944

### 13% of TOTAL KILL

### TOTAL KILL .....

Take a look at the maps (Figures 1-6) and you can readily see where your "home" or "favorite" county stands in relation to all others in number of deer killed this past year. All data are ranked, i.e., the numbers show relationship of counties as 1st, 2nd, etc. Study them. If all these maps were superimposed on one sheet, one fact would become very evident. With the exception of highway kills, the 5 leading counties in each category of mortality, when lumped together, would show that 13 counties have the bulk of the TOTAL KILL. These counties are located in the northcentral part of the state. This is where the major "DEER PROBLEM" lies. The Game Commission is attempting to cope with it through sound management procedures, but it must have the co-operation of Pennsylvania sportsmen to prevent this waste of recreation and meat. It is your deer which is lost. Help us save it for you.

*The maps on the following pages show the distribution, by counties, of deer mortality from all causes during 1951.*

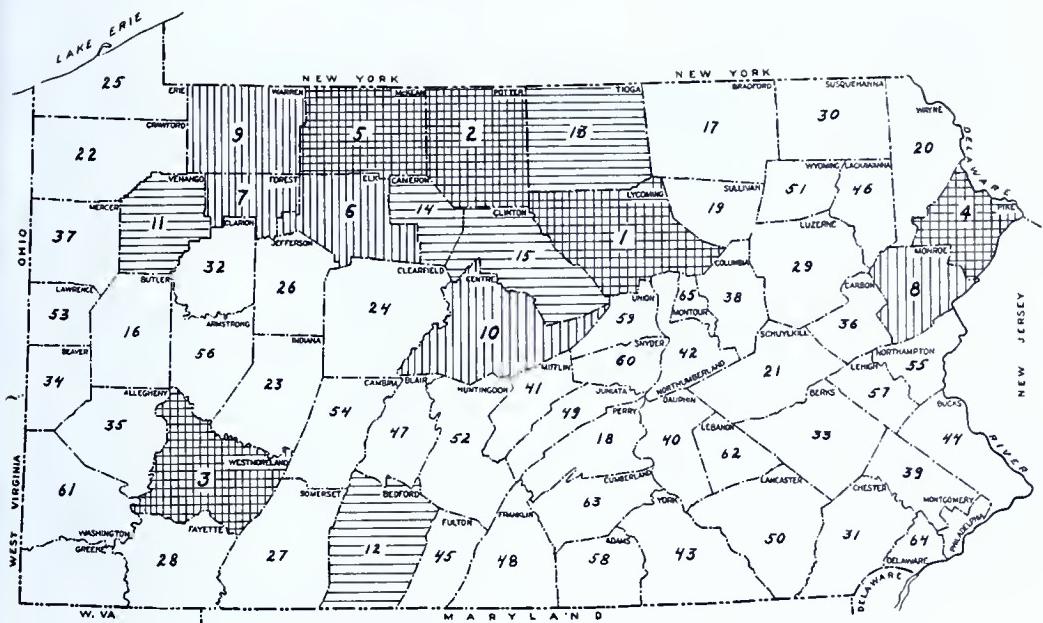


Fig 1 - Deer killed by Vehicles

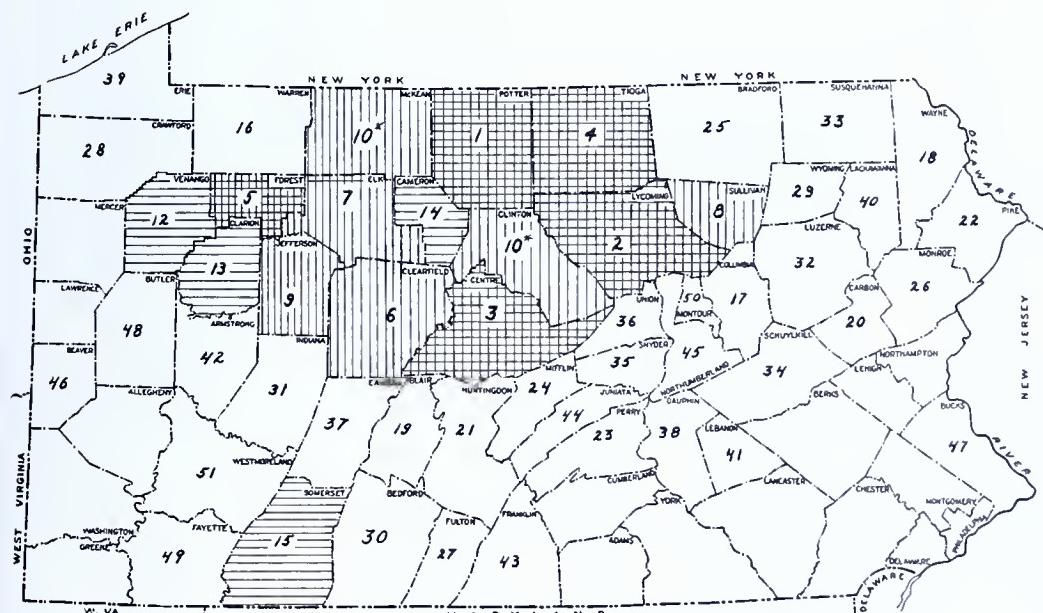


Fig 2 - Deer killed for Damage

Counties ranked in first 5  
 " 6-10

Counties ranked 11-15  
 16-67 Rank only

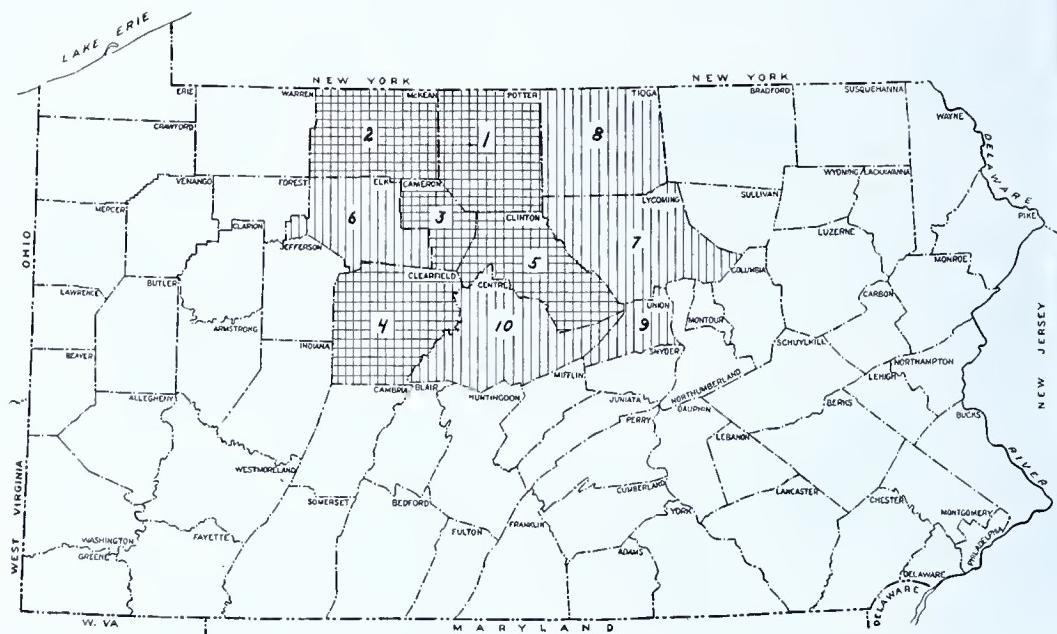


Fig 3- Deer dying of Malnutrition

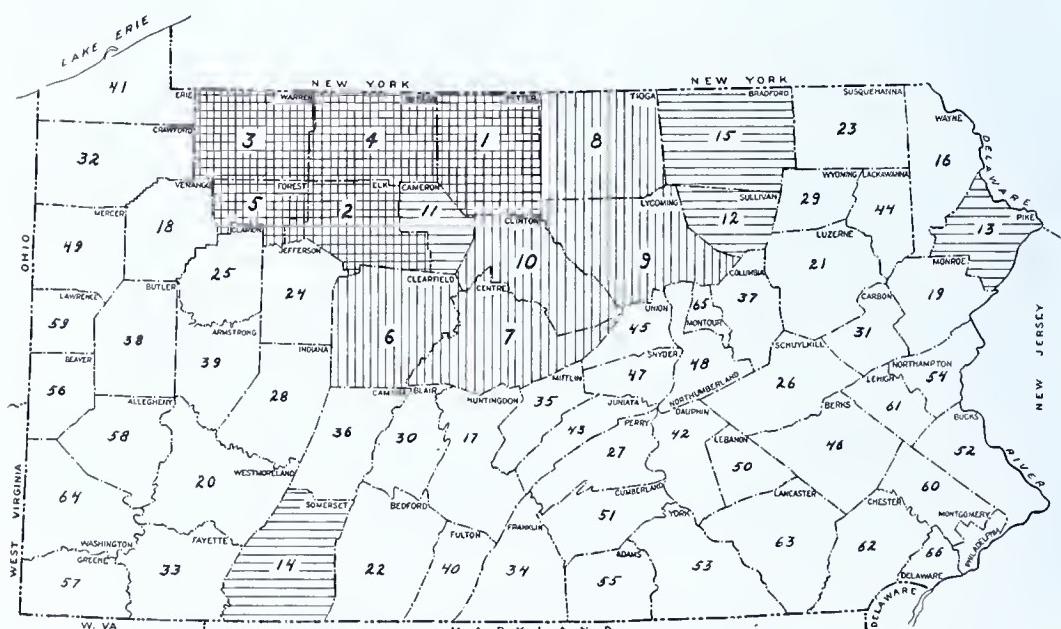


Fig 4-Legal Antlered Deer Kill

- Counties ranked in first 5
- " " " 6 - 10

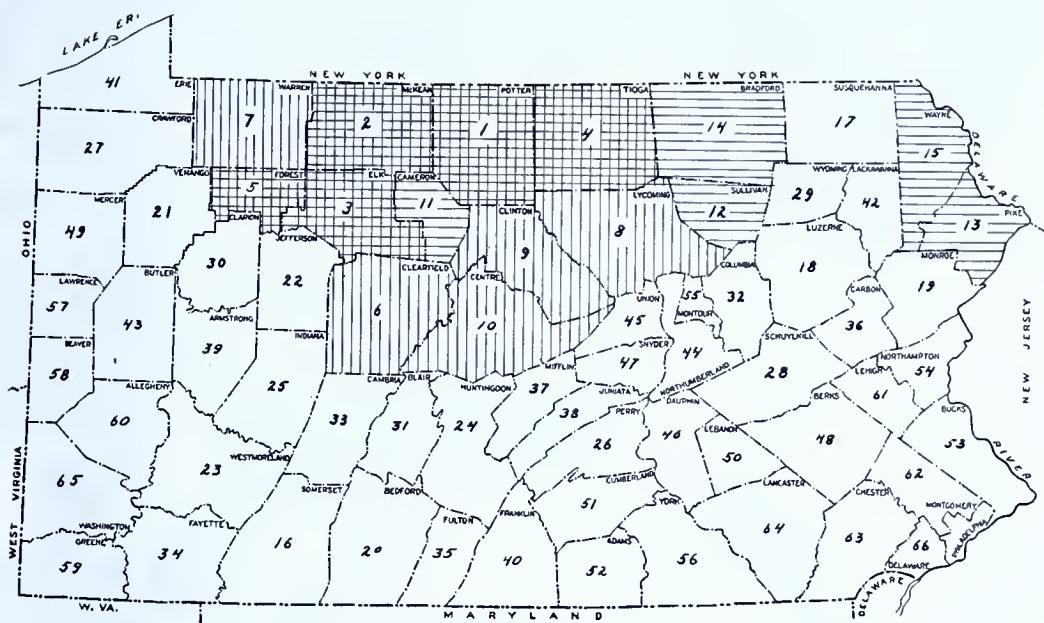


Fig 5-Legal Antlerless Deer Kill

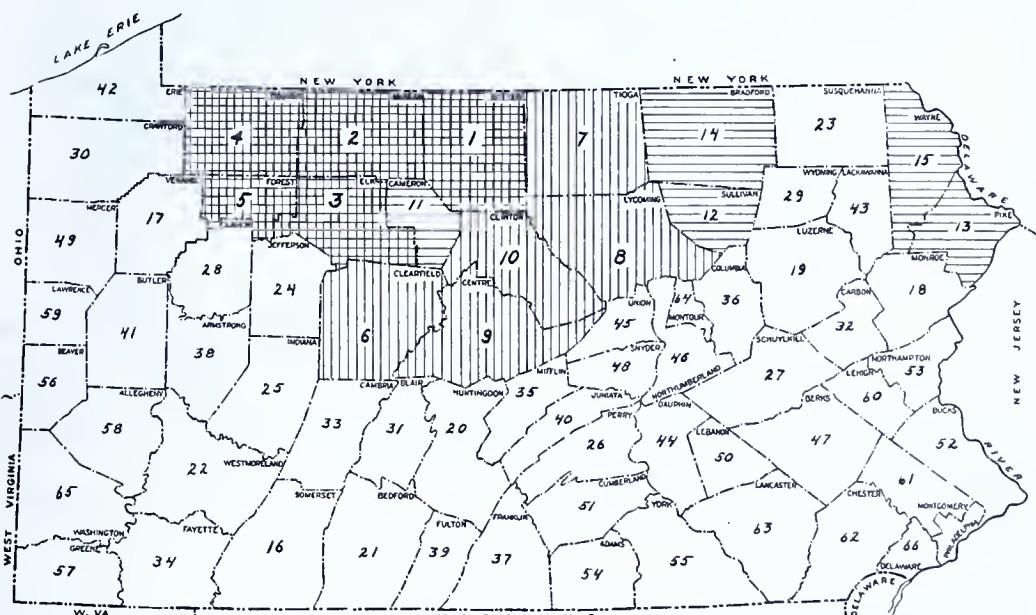


Fig 6-Total Legal Deer Kill

Counties ranked 11-15

16-67 Rank only



## Outdoor Kids

By Hal H. Harrison

IN THE wintertime, Pennsylvania folks usually refer to their woods as "bleak and barren." The leaves are off the trees; the flowers and the weeds are brown and colorless.

Despite all of this, Billy and Jane have discovered that the Pennsylvania woods have much more green in the winter than most people realize. Oh, everybody knows we have evergreen trees, like pines and hemlocks, and some folks are conscious of the laurels and rhododendrons. But not everyone realizes that many of the smaller plants on the floor of the forest retain their greenery all winter.

For example, not all of the ferns die off in the winter. Many common ones, like the Christmas fern, are green always.

Billy and Jane like ferns. There are about 250 kinds in North America and about 10,000 kinds in the world.

While it is necessary to look closely at some ferns before they can be named, others can be identified as you walk past them. This is possible simply by knowing the shape of the leaves, the height of the plant, the location (as in a swamp, a forest, or a field), or even by the shade of green of the leaves.

Easy-to-name ferns include the maidenhair, bracken, sensitive, cinnamon, royal, Christmas, New York, and polypody. Billy and Jane have not tried to name all of the ferns, for some are not easy, but they know many of them just as soon as they see them.

The first thing to do is to make sure you know a fern when you see one. Some flowers have fern-like foliage: yarrow, sweet fern, buttercups, wild columbines, Queen Anne's lace, and tansy.

Ferns do not produce seeds, as the flowering plants do. Instead, they produce tiny spores. The principal difference between a seed and a spore is that the fern spore must pass through two stages before it becomes a plant, while a seed goes directly into a plant like the parent.

The leaves of ferns are called fronds. Some ferns produce spores on their fronds. Other ferns bear spores on separate spikes, and these are called "flowering" ferns, because the spore spikes look like flowers, even though they are not.

Young ferns come through the ground and uncoil like the spring of a watch. They are called "crosiers" or "fiddleheads."

Billy and Jane collect fern fronds. They press and dry them between large pieces of blotting paper, and then they mount them with Scotch tape on sheets of white cardboard.

Some day they hope to have in their collection a frond of each of the 59 ferns that grow in their state of Pennsylvania.

. . . *The End*



#### THE MUSKRAT—

The muskrat's as popular as can be,  
On many a coat its fur you'll see.  
He loves the marsh, the stream and pond,  
Of roots and stems he's very fond.  
His value to trappers is really immense,  
For it's measured in good old dollars and cents.

—Leo A. Luttringer, Jr.





# CONSERVATION NEWS

## Early Season Small Game and Human Casualties

Reports on the hunting success of the early part of the 1952 small game season, delayed until November 11 over most of the state, seem to substantiate pre-season predictions of generally good game populations. As always, there were some unexpected conditions found spottily.

It appears, also, that apprehensions that pent up enthusiasm and a holiday spirit could cause many unnecessary human casualties also were well founded. It takes time for hunting "accident" reports to be filled out, mailed and tabulated, but from newspaper accounts and others it has already been learned that too often, for lack of caution, good sense or gun safety training many hunters were needlessly shot by others or themselves.

Excitement, carelessness, greed and the fatal optimism, "It can't happen to me," are the causes of most gun tragedies. Many a person has become a hospital case or a vital statistic only because normal caution and consideration for the other fellow was cast aside in the hunting field.

## Only Hunting License Fees Erroneously Collected Can Be Refunded

The Game Commission, after a special meeting, November 14, made the following announcement:

In consideration of the extended hunting season and the fact that hunters' licenses are good until September 1, 1953, the Commission does not feel called upon to generally authorize refunds to persons who pur-

chased licenses and were unable to use them during the period that the season was suspended because of drought conditions. On the other hand, under an opinion of the Attorney General, the Commission will give consideration at its January meeting, to refund hunting license monies proved to be erroneously collected.

## Pennsylvania Hunting License Sales

All returns having been received from issuing agents, the Game Commission reports that 1951 Pennsylvania hunting licenses issued totaled 857,322, compared to the 1950 issuance of 834,172 licenses. The hunting license period runs from September 1 of one year to August 31 next following. Resident hunting license numbered 826,044, nonresident 31,278.

Included in the resident license figure were 15,317 free licenses issued to members of the armed forces (no longer in effect), and 378 free licenses to disabled veterans.

## RESIDENT AND NON-RESIDENT HUNTER'S LICENSES ISSUED BY COUNTY

	Resident 1951	A.F.	D.V.	Non- Resident 1951
Adams .....	5,648	( 134	2)	41
Allegheny .....	66,918	( 618	2)	19
Armstrong .....	13,135	( 212	5)	13
Beaver .....	13,709	( 113	8)	28
Bedford .....	7,871	( 120	5)	37
Berks .....	22,133	( 441	4)	4
Blair .....	16,152	( 330	4)	15
Bradford .....	9,076	( 160	4)	61
Bucks .....	10,560	( 402	3)	83
Butler .....	12,954	( 190	6)	12
Cambria .....	22,167	( 258	15)	18
Cameron .....	1,861	( 45	..)	39
Carbon .....	6,220	( 157	5)	6
Centre .....	11,304	( 250	13)	22
Chester .....	13,076	( 185	4)	43
Clarion .....	8,307	( 97	9)	38

Clearfield .....	14,748	( 263	10)	441
Clinton .....	7,866	( 206	6)	198
Columbia .....	8,441	( 233	1)	91
Crawford .....	13,408	( 160	12)	669
Cumberland .....	13,270	( 323	1)	42
Dauphin .....	19,268	( 930	2)	158
Delaware .....	11,473	( 189	4)	156
Elk .....	6,809	( 126	2)	535
Erie .....	22,522	( 279	14)	762
Fayette .....	17,972	( 281	12)	170
Forest .....	2,197	( 37	2)	663
Franklin .....	10,770	( 258	1)	332
Fulton .....	2,277	( 49	3)	120
Greene .....	4,749	( 88	7)	96
Huntingdon .....	7,618	( 164	18)	190
Indiana .....	11,763	( 206	9)	235
Jefferson .....	10,623	( 148	9)	1,422
Juniata .....	2,933	( 64	2)	34
Lackawanna .....	14,240	( 335	17)	214
Lancaster .....	27,179	( 362	5)	180
Lawrence .....	11,277	( 147	7)	1,094
Lebanon .....	10,654	( 603	8)	40
Lehigh .....	12,333	( 379	1)	82
Luzerne .....	27,893	( 611	24)	382
Lycoming .....	15,936	( 334	11)	313
McKean .....	10,214	( 193	..)	1,590
Mercer .....	14,687	( 140	4)	1,797
Mifflin .....	7,598	( 291	7)	139
Monroe .....	5,894	( 137	3)	522
Montgomery .....	21,301	( 255	8)	79
Montour .....	2,119	( 68	2)	18
Northampton .....	15,367	( 189	..)	671
Northumberland .....	13,386	( 215	..)	61
Perry .....	4,464	( 83	2)	38
Philadelphia .....	22,404	( 879	..)	607
Pike .....	2,005	( 41	2)	1,646
Potter .....	4,141	( 78	..)	1,896
Schuylkill .....	19,557	( 287	9)	66
Snyder .....	3,788	( 59	1)	24
Somerset .....	13,344	( 221	11)	308
Sullivan .....	1,816	( 175	2)	82
Susquehanna .....	4,955	( 64	1)	316
Tioga .....	7,412	( 107	5)	715
Union .....	3,748	( 107	5)	40
Venango .....	9,841	( 163	5)	595
Warren .....	7,056	( 114	2)	1,666
Washington .....	16,094	( 154	7)	409
Wayne .....	5,114	( 93	5)	603
Westmoreland .....	33,258	( 308	16)	320
Wyoming .....	3,042	( 57	..)	110
York .....	22,615	( 295	4)	463
Dept. of Revenue	1,514	( ..	..)	3,031
Totals .....	826,044	( 15317	378)†	31,278*

\* Include alien Non-Resident Hunters' Licenses as follows: 1950, 5; 1951, 3.

† The figures in parenthesis indicate Free Licenses Issued to Members of the Armed Forces and Disabled Veterans‡, which are included under column "Resident Licenses." A.F. indicates Armed Forces; D.V., Disabled Veterans.

‡ The 1949 General Assembly authorized the issuance of "Free" licenses to Disabled Veterans.

## Duck Stamp Sales Reach New High

Over one-quarter of a million more duck stamps were sold by the Post Office Department during the fiscal year 1951-52 to hunters of migratory waterfowl, conservationists, and philatelists, than during the preceding year, according to the Wildlife Management Institute. The total of

2,167,767 stamps sold shattered all previous sales records according to Albert M. Day, director of the Fish and Wildlife Service.

## NO CHRISTMAS HUNTING

The Pennsylvania Game Commission at a special meeting held at Harrisburg, Saturday, November 22, reconsidered the days and dates previously approved as an extended open season for cottontail rabbits, squirrels (gray, black and fox), ringneck pheasants (males only), and grouse, and recognizing the sanctity of Christmas Day, decided to close hunting of these species on December 25, 1952.

The special extended season for cottontail rabbits, squirrels (gray, black and fox), ringneck pheasants (males only), and grouse during 1952, shall be December 22, 23, 24, 26 and 27. Christmas Day, December 25, 1952, will be close season and hunting wild game on that date is prohibited.

## Stewardship Of Game Fund Reported

For some time the policy of the Game Commission has been to use game fund monies, largely provided through the sale of hunting licenses, for the benefit of Pennsylvania wildlife as soon as it can be judiciously put to work.

Since the Commission has no authority to borrow money it is necessary to have enough funds reserved in late spring of each year to pay bills coming due during summer and early fall, when the income is negligible.

Evidence that the Game Commission is operating under this policy is that on October 17 the Game Fund cash balance in the State Treasury amounted to only about \$76,000. Had all pending bills in that office been liquidated as of that date the balance would have been less than \$60,000, a narrow operating margin.

Money now being received from the sale of 1952 hunting licenses will

not only finance wildlife programs, it will build up cash on hand so that the game authorities will be in position to finance its operations during the next year.

### Sportsmen Honor Farmer Conservationists

Four Minnesota farmers recently were honored as the state's outstanding farmer conservationists at the Northwest Sportsman's Show in Minneapolis, according to the Wildlife Management Institute. The winners were selected by a 20-man committee, headed by Leland J. Melrose, editor of the Minnesota *Farm Bureau News*, after the records of some fifty farmers had been examined.

Selections were made on the basis of records submitted by county agents and others interested in natural resources conservation. Each of the men honored was regarded as having made outstanding contributions to the conservation of natural resources of his farm and his community. Soil, water, and wildlife conservation practices used formed the basis for decision. Winners were: Jeff Tikkonen, New York Mills; George Highum of Peterson; Wilbur Hartberg of Heron Lake; and Birney Wilkins of Brainerd. All winners and their wives received free trips to the show where they were awarded citations at a special ceremony. Similar recognition of accomplishments by farmers on the part of organized sportsmen's groups elsewhere, whether at state, county, or local levels, might assist materially in furnishing mutual understanding between the man on the land and the sportsman.

### Trumpeter Swan Population Still on Upgrade

America's largest waterfowl, the trumpeter swan, appears still to be on the come-back trail in the United States with the latest U. S. Fish and

Wildlife Service census figures showing a total of 571 birds, an increase of 36 over last year's count, the Wildlife Management Institute reports. In 1935 only 73 birds could be found.

The trumpeter swan was once found throughout most of North America, but its numbers were greatly reduced by relentless market hunting and destruction of its breeding habitat. In 1907, small flocks were discovered at Red Rock Lakes in Montana and in Yellowstone National Park, and restoration efforts were begun by the Federal Government. Refuges were established for its protection, and birds since have been transplanted to several western national wildlife refuges where new nesting colonies have been formed. Larger flocks breed in Alaska and Canada, but most of these birds rarely reach the United States, preferring to winter in open patches of water where swift currents prevent the formation of ice.

Kangaroo rats, pocket mice, prairie dogs, gazelles, and dozens of other desert animals, pass their whole lives without touching a drop of water. The liquid necessary for their bodies needs is obtained through chemical action in their digestive tracts where by some of the starchy parts of the food are changed into water.

\* \* \*

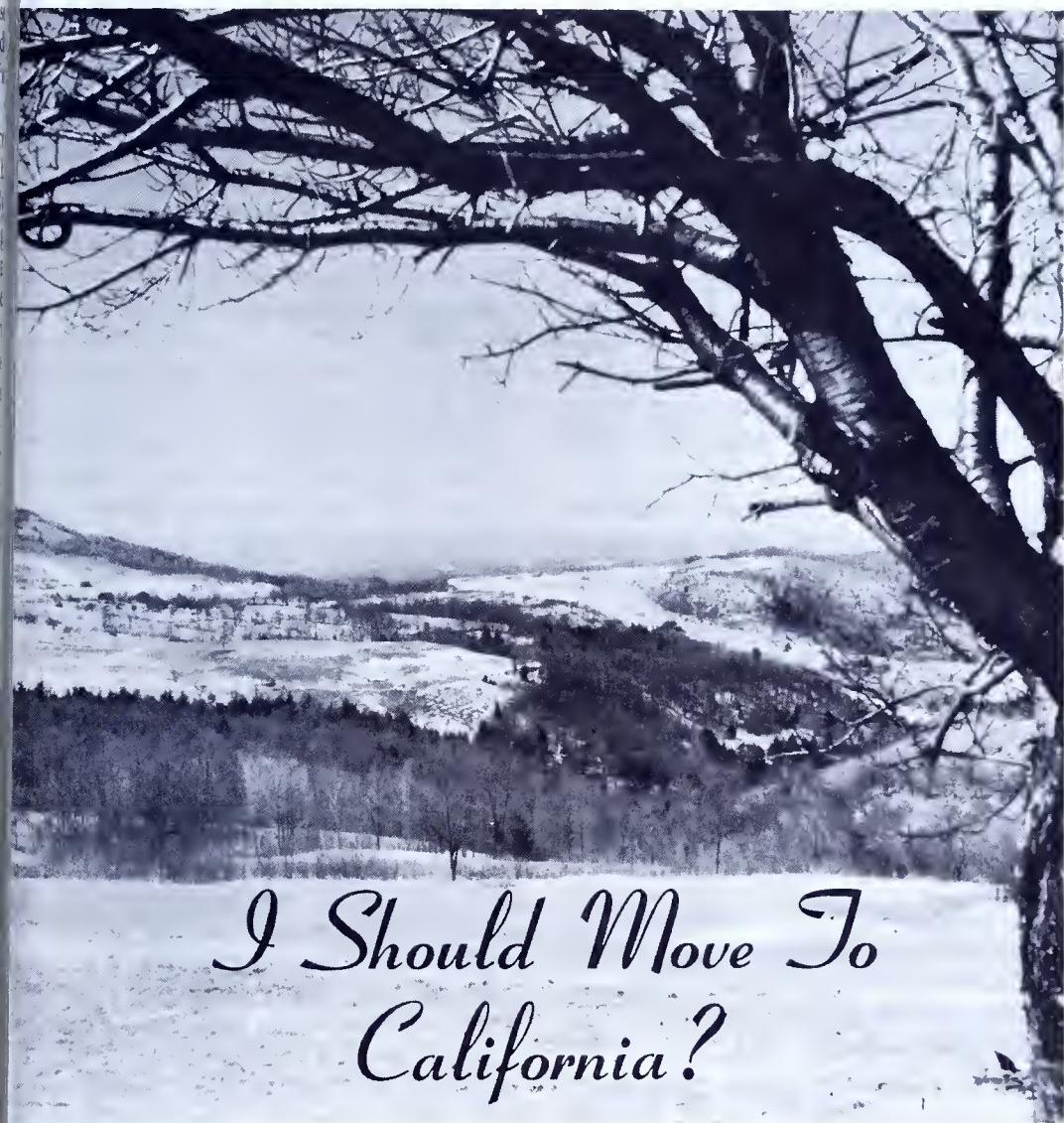
The man of war, or frigate, bird is a genuine feathered airplane. The enormous stretch of its wings measures  $7\frac{1}{2}$  feet across.

\* \* \*

The earthworms of Australia often grow to a length of 12 feet.

\* \* \*

The beaver, when frightened or disturbed, strikes the surface of the water a resounding slap with broad flat tail. Every beaver within hearing distance disappears as if by magic.



# *I Should Move To California?*

By Thad Bukowski

ONE day, during the course of an interesting conversation, a smooth looking, dapper, young man of my acquaintance asked me the somewhat stupendous question that is asked of almost all men.

"Why don't you move to California?" he said "You'd make twice as much money there! In fact, I can get you twice your job if you leave with me."

California! Wonder of the gods and all men who hope to live there! One could only wonder at what that

single word could do to the conjectures of the uninitiated . . . .

I paused reflectively in the midst of a half spoken sentence, thinking of the manna that was wont to be associated with that favored of states and finally answered, almost apologetically: "I can't just pull up stakes and leave. I've bought a home, I've got a job and I'm beginning to raise a family. And . . . well you know how it is . . . ."

He, however, contradicted my excuses: "Well," he said with finality,

"I'm leaving. I'm fed up with this part of the country."

True to his word, he started his sojourn a few days later.

The simple events that transpired in that conversation made me think. What made him leave and me stay, other than the ordinary ties of home, furniture, family, etc.? Surely, if he could pull up stakes that easily, I should be able to do so also, for the promise of double my present wage was not to be sneezed at. What then, besides the ordinary ken had made me think twice and decidedly made me want to stay?

Little by little it evolved. One often doesn't appreciate the simple events of each day because they are so commonplace. But when we once look for the real values and enjoyments in life they may come as a shock because of their very simplicity.

I live on a hill at the outskirts of a western Pennsylvania city of some 50,000 population. You'd say that I live on a hill if you saw my place, though it is really a broad expansive plateau. I own an acre and a quarter that pushes against a brushy entanglement of young locust, dense blackberry, uncut weeds and grasses, and finally, stately, supreme, and majestic oaks. For two hundred to five hundred acres back of my home I can travel afoot into a forest of autumn fiery maple, wild cherry, barbed locust, and the state's beloved dogwood. Savanna-like brushland intersperses the majestic thickets of treeland and vine. Time and again I've tried to learn from my neighbors who owned it all, but no one could tell me and no one seemed particularly to care. It seems that it remains untouched simply for the enjoyment of those interested. So, of late, I've been spending many a day there.

On one of my first excursions I found a stream which rises from the ground in the thicket. It bubbles and rushes merrily away, singing over rocks and disturbing the woodland

only by its perpetual, sleepy, unchangeable chant. Of more interest to me are the wild briar that I have difficulty to wade through, occasional masses of brush piled up in heaps as a result of what seems to have been a long ago forgotten lumbering operation, and in the midst of these the quick scurry of a rabbit, the quarreling of a squirrel, and the occasional, distant, cackle of a cock pheasant.

About a year after I'd moved into this home that nestles against the wild sylvan haven, my kid brother-in-law injected me with a violent spasm of the hunting fever, and brought me a beagle pup to frolic with on my jaunts. In the year that followed together we've further explored our new found trove of land treasure.

"Mick" and I take off from the dilapidated lean-to shed in the back yard that I've so often promised myself I'd fix. In his early days as snuffed in playful and sometimes confused puppyhood, I would often lean back against a tree and stifle laugh at the pup's snorts, romps and wistful tree inspections. It was so much play for him, so I got onto the idea that the relaxation was just as good for me, too. When he finally grew to trailing rabbits it was even more pleasant to watch him, in seasons matching talents with the wily bunnies. For a long time I thought I had a mute dog until one day upon the advice of an expert in the field of the training of dogdom, I attached a length of clothesline as a sort of loose leash upon which the dog was to strain on a hot trail until he got the idea of baying. So it would happen that on that day the pup never tramped on a bunny and nearly mangled me in the excitement that followed. But horray! As I got him from the ground and felt for missing body parts I knew I had a trail-baying hound. After that incident I had a hard time keeping him quiet.

Out of the backyard and into the woods in just a few minutes. Here was something I learned not every man could hope for, and not in just my place in California, either. So what is it worth—in other than money, that is, if you measure life and the pleasures that come from living with other than simply monetary values? Of course, it is impossible to say. One can only experience it and be eminently satisfied.

Take my last year of hunting for instance. I work during the daylight hours like so many other people. I leave my house at a quarter of eight to get to my job on time. This leaves mighty few days for hunting. A Saturday here and there, Thanksgiving, and an occasional day of grace such as Armistice Day, if it falls during the week.

My back plot comes to the rescue though. I garden the acre in my spare summer moments, and like any supposedly wasteful gardener, leave quite an amount of crop residue in the form of corn, beans, peas, carrots, and beets and the like laying around in the fall. Seems as though the game in the big thicket behind the garden goes for that in a special way. During the summer, I'd often noticed Mr. Cock Pheasant having a guilty go at my corn and I'd craftily laugh it off with "Wait till November, when you're well fattened. That'll be the season of reckoning." Unlike these feelings, however, I've had only consideration in my heart for the matronly hen that has lived in my backyard with a brood of young'uns growing for the future hunt, off and on these past three years.

Well, sir, as November rolled around and I'd noticed game parading in my backyard at one time or another I decided that I didn't need too much time to take pot luck. Three quarters of an hour or so, early in the mornings before I went to work seemed like time enough for a successful shot or two.

This year, beginning the second day of the hunting season, I went out nearly a dozen times for early fast hunting tramps through my lot and a part of the wilds behind it. And though I didn't shoot something every day, each of the mornings was a fortuitous adventure. Not only did I experience the pleasure of frost crinkling leaves and grasses underfoot and the smell of virgin air, unsullied and unsmoked, but I saw wildlife on almost every occasion.

The second day of the season—my first—I went out and hadn't but traversed my acre when there was a spluttering and a fluttering of wings in front of me. No squawking cackle though. I began my swing and then softly cussed my luck at the vision of the hen pheasant I saw boring through the autumn air.

"Oh, well," I said, almost pleasantly after a moment in my chagrin "it was fun anyhow," when I suddenly heard the distant, raucous cackle of a cock bird beyond the trees to my left. I turned my head and could barely make out the outline of heavy wings, rising, rising, almost ponderously over the trees. What a bird! My heart beat hammer blows then thumped to the weight of the sledge inside me. The bird was heading for the head-high brush behind which I stood, immobile, with the gun to my shoulder. The day of reckoning had finally arrived.

So help me, I had to shoot in self defense. He'd have knocked me over if I had let him come. When he got in my sights I squeezed the trigger; the portly corneater bounced at my feet, as plump a wingpusher as I'd ever seen. I looked at my watch. Ten after seven. A mighty fine morning . . .

Fifteen minutes later I was rounding a brushy field when another cockerel lit out with a squawk of excitement. I took three quick shots and could have taken three more for all the good I did. That bird certainly

must have been hunter-and gun-shy after that with my two 7½'s and a number 6 spreading out behind him in his flight. I laughed as I watched him distantly climb over some small trees and settle towards the ground. Too far to follow. "At least I won't have to clean two," I rationalized, quite loudly.

A few days later I took three quick shots at a bunny right inside my acre. We played peekaboo between the cornstalks and some raspberries I had let spread out and I'd reloaded for the fourth when Mr. Bugs settled himself safely under a pile of brush. "Oh, well," this time I thought, "bad shooting, but good conservation."

The next week a quail exploded from under my feet, the first I'd seen in years. I let it float gracefully away, without shooting, hoping that it would be joined by others so that the population of this now so scarce bird would thus have a chance to remultiply.

And then I learned what was drinking the water around the sinkhole. I never took my beagle on my three-quarter hour forays, for I didn't have the heart to stop the little hound after so short a hunting period. It was because of this latter fact that I was able to get so close to the deer that came upon me.

I had stepped behind a brushy haw with its spiny branches thickly spreading in every direction when I heard a crackle behind and to one side of me. I half whirled, setting my gun in front of me, then stood with every muscle as still as I could make it. Presently a doe, the most beautiful I'll ever want to see afoot, nudged its way out of the entanglement. Ears working back and forth inquisitively, it wanted to see what was behind the tree. It came closer, closer, twelve feet, then ten. Its tail flicked and bobbed, once, twice. The ears moved again. Still closer. When not more than eight feet away it decided that I was okay and looked the other way.

I'm sure if the season had been in I wouldn't have had the heart to dispose of this particular pretty friend with its shining coat standing so sleek and so close to me.

Thinking that this was being tame with the deer season approaching I jumped and yelled when I passed and stopped about fifteen feet away. Nonchalantly, the Bambi-like critter looked at me as though to say, "Well now, old boy, I know you're kidding, so don't go around trying to make funny noises and looking silly." And then it settled itself to munching the grass nearby. Tell me, brother, could you beat that?

As a youngster life was similar. Days of early childhood often come to mind and are again lived in vicarious venture at my parents' home. In youths, my brother and I thrived on the outdoor life taught us in the company of a colorful and fond father. Dad was a hunter and a fisherman of some note, so he told us, in his early days, before he had crossed the wide ocean and settled in Pennsylvania.

Huck Finn had nothing on Dad. Many an evening was spent in rapt attention as Dad told us wild and weird tales of the Carpathian Mountains, strange marshes, hunting estates and the wolf packs of interior Europe from where he had come.

During the depression I believe that Dad worked three days a week and the rest we spent very profitably in the field. Money was scarce, so Dad decided we would fashion our own equipment. No willow wands though. Dad said willow wasn't strong enough for the fish we were going to catch. Laboriously we cut down long lengths of tough, spiked, gnarled thorn, trimmed and peeled them. When they dried they were lighter, but still heavy duty equipment.

We had fun galore. We were fortunate enough to have two fine lakes within three miles of our home. Each morning we could make it during the summer we were up about

three thirty in the morning, had a quick breakfast with Dad and then headed out into the crisp night with its still starry sky, and fading moon. Dad — short, squat, red-mustached, jolly two hundred pounder that he was—led in the front, a minnow pail in one hand, and poles over his shoulder. My brother Stan and I tagged along, staggering under the weight of the lumber of our own home fashioned fishing tackle. Our trek was always uphill, following suburban woody trails and back country lanes until about an hour or so later we'd hit the peak of our climb. Just as the sun would spread its shining rays over the southeastern horizon we'd look down at the lake before us, ringlets of fog rising from it, and quicken our steps.

Each fishing trip was an adventure, for Dad was the kind who spit at cats, and laughed at lightning. He could spread eagle under a tree and relax in self-satisfied contentment when the most urgent things had to be done.

I'll never forget the day he caught his largest fish. It was a three foot carp that weighed twenty-six pounds. He strung it to the side of the car and rode around town tooting a horn to show the result of his accomplishment. Then he took it home, "butchered it," for it was the size of a sucking pig, and called all the kids from the neighborhood to the back yard. Thereafter began one of the strangest of fish fries. Since the fish was out of the fresh waters of French Creek it tasted exceedingly good and came to the back yard on plates in the form of "pork chops." Everyone had a gala time and we gorged ourselves, not knowing that we were eating a fish so despised as adequate table fare.

A few years later when the local lakes became filled with sediment and the fishing began to lag I went off to school and then still later to a relatively long stint in the Army. When

I got back I was married to a Western Pennsylvania Gal, had bought my new home, and learned, fortunately, that the in-laws were hunting fiends. That's the nicest kind of fiend I can think of, for previously my mother had been inordinately afraid of firearms and a gun was never permitted in the house. It was different now, with my own home. I became fast friends with my kid brother-in-law, who would rather hunt than eat. He introduced me to upland game and the hunting I mention I found to be more exciting than anything I had previously experienced. He further introduced me to the world of the beagle, that merry, twinkle-eyed, happy hound, and together we began to live our November's hunting. When his indomitable hound, Queen, accidentally lost her life, he took me with him to buy a new bitch. The following year he brought me a pup from the litter, the dog I now own. I knew so little, I was learning so much. New experiences every day are the pleasures of life and life was becoming proportionately more and more liveable with the coming of each new sunrise.

My pup arrived almost two years ago. Together we've lived a good happy hunting year in the field. I can still remember how pleased though battered I was when I heard him give forth with his first excited sounds, sweetest of music to the houndsman's ears. With me on the wrong end of that training clothesline, I had occasion to say, "Mick, you old sonafugan. You've finally got the idea. You're yowling a blue streak."

And I get the idea, too, now. I certainly wouldn't miss this type of a life with all the interesting folk around me, and the wildlife I find so close at hand for all that California, or any other state, might ever provide.

. . . *The End.*



### Out of the Mouth

**WILKES-BARRE**, Luzerne Co.—I received a call to pick up a young rabbit reported by Michael Kluk, Wilkes-Barre, Pa., and after contacting him he related this story to me. Mike had his hound out for a chase one evening and he came in with a small showshoe rabbit in his mouth fully alive and about three weeks old. Evidently Mike's hound is falling in line with conservation principles. District Game Protector John C. Behel, Wilkes-Barre.

### Stretched Snake Is Turkey Dinner

**AUSTIN**, Potter Co.—While on patrol one morning during September, I observed a flock of turkeys feeding in an old field, and stopped to watch them. I saw one of the birds was striking at something in the grass and was following it. I then started watching this one turkey with my binoculars and as I did, the turkey picked up a snake in its bill that was about two feet in length. The

snake immediately started to coil about the bird's neck. This did not worry the turkey in the least, as it stood on one foot and hooking its toes of the other under the snake's coil, it pulled it loose and then stood on it and still holding it in its bill, started to stretch out the snake. This continued for a couple of minutes until the snake was dead. The rest of the birds had by this time gone some distance ahead so the snake-killing turkey started running after them, still holding on to the snake. As soon as it came in view of them again, it stopped and started to swallow its catch. I thought for a few minutes that it would choke to death trying to get the snake down, but again the bird was equal to the occasion, and the snake disappeared after a few minutes. The turkey then ran to catch up with the others, and kept on feeding as though it had not eaten anything at all. I have known of snakes swallowing small turkeys, but this was one time that the tables were quite turned around. District Game Protector William D. Neel, Austin.



### Bear Cub Craves Power

**EMPORIUM**, Cameron Co.—H. Land Reed, R. D. No. 2, Emporium, has been cutting paper wood on State Game Lands No. 14, and on September 23, 1952, he met with a very thrilling experience. He was loading his truck with wood this morning and if Mr. Reed had known what he would face this day, I doubt if he would have left his farm. In the thrill he was to encounter. Laboring over his loading job, Mr. Reed had little thought of any visitors.

here he was working several miles back in the woods on a State Game and road, until his eye suddenly caught a movement in the brush and looking long enough to see who his visitors were, he was more than surprised to see none other than four cub bears and two mother bears not more than a few yards from him. As Mr. Reed looked on he was surprised to see one of the cubs make for his power saw and knowing how bears like to take things apart, Mr. Reed was afraid the saw was about to be dismantled, so he yelled at the cub which in turn squealed and climbed up a tree. This brought the mother bear to the rescue in a hurry. She came to within arms length. Why she stopped, no one knows, but Mr. Reed picked up a club and swung it back and forth. The cub came down and all decided to leave. District Game Protector Norman L. Erickson, Emporium.

### Conscientious Coon Hound

BLOOMSBURG, Columbia Co.—I was listening to the woes and lamentations of a coon hunter from the northern part of the district recently and here is his latest complaint: "Why you remember that yaller hound I had last year. Every time I was ready to go huntin' all I had t' do was whittle out a stretchin' board, jest to show him the size I wanted and have him look it over. Well, a coupla weeks ago the ole woman was ironin' on the back porch and left the ironin' board lean' up again the house. The critter ain't come home yet." District Game Protector Mark L. Hagenbuch, Bloomsburg.

### Sportsmanship

ROCK GLEN, Luzerne Co.—On the first day of the special archery season Carl Irvin of Rock Glen was hunting in the vicinity of his home. Shortly before 5 p. m. he spied a nice

buck. He scored a hit with his arrow but the buck did not drop. After a futile search he returned home and called my headquarters. He told me the buck was hit hard and he was afraid the deer would spoil if it laid out overnight. A search was made with flashlights but failed to locate the deer.

The following morning a man, training dogs, came across the dead buck, still warm and with the arrow imbedded in its side. Mr. Irvin was called from work and tagged the first buck in this area, a beautiful eight point specimen. District Game Protector Samuel C. McFarland, Drums



Unwelcome Guest

WASHINGTON, Washington Co.—In October I received a call from the city police that a deer was in the George Washington Hotel, trapped in a revolving door. The first thing I thought of was that someone was ribbing me, so I asked again who was calling. The same thing came over the phone; the deer was in the hotel. By the time I arrived at the hotel, a sizeable audience had gathered. After a short tussle, however, I had the deer hog-tied and in my car, later releasing it in better quarters. District Game Protector George T. Church, Jr., Washington.

### Rare Rail Recovered

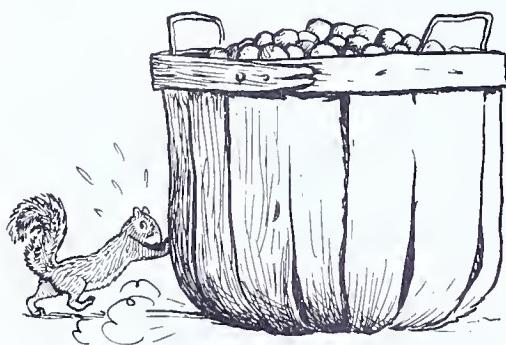
**WYOMING**, Luzerne Co.—On the night of September 28 while on night patrol in the vicinity of Mt. Olivet Cemetery in Luzerne Co., I found a small bird on the road in a very weakened condition. I took it home and cared for it and tried to identify it. Unable to make positive identification it was taken to the Eberhart Museum at Scranton where Mr. Kelly identified it as a yellow rail. He states that this is the only bird of his species that has been recorded within a 30 mile radius of Scranton in the past 40 years.

This bird died and was given to the Museum for mounting to replace a specimen which has been in the Museum since about 1912 and was badly faded. District Game Protector George A. Diffenderfer, Wyoming.

### Nuts To Squirrels

**MEHOOPANY**, Wyoming Co.—In three weeks this fall a single pair of gray squirrels carried off nearly three bushels of black walnuts in preparation for the coming winter. They exhibited little fear of our cocker spaniel tied on the back porch and went by within a few feet of the dog in order to get to the nuts which are stored in baskets beside the porch. At first they were quite courteous and removed the hulls at some distance

from the house but later the nuts were peeled right on the spot and each day they left a neat pile of walnut hulls to be swept off the concrete walk. The enjoyment of watching them at odd moments, however, was well worth the little extra work entailed. District Game Protector Thomas W. Meehan, Mehoopany



### Bass Fisherman Bags Owl

**LAPORTE**, Sullivan Co.—While fishing in the Big Loyalsock Creek for bass, Lee Norton had one of the unusual experiences, long remembered and talked about. Mr. Norton had been fishing for a while and then the moment came when he had what he thought was a good strike. Setting the hook he began to play the fish but was very much surprised to find his strike had taken to the air. After considerable time and difficulty he was able to land his prize, a very large great-horned owl, that he had caught the surface lure he was using for bass. This may prove that the great-horned owl is a fisherman as well as a hunter. District Game Protector Robert K. Benscoter, Laporte

# The Micro Trigger Winchester 52

By Ed Shearer

**B**ACK in 1920 at the Interstate Matches at Sea Girt, New Jersey, I had my first look at a Winchester Model 52. It was the new 22 cal. rifle that was destined to play a stellar role in American shooting history. I was shooting on the Pennsylvania National Guard 30 caliber team at the time.

As I strolled down the firing line one afternoon my attention was directed to a woman who was shooting a strange looking rifle. The light pip of the rifle contrasted sharply with the heavier report of the Springfield rifles up and down the line. The fact that the lady was shooting at a 7.2 inch bullseye instead of the regular military 10 inch standard at 200 yards was enough to make any shooter stop and look at that time. The white paddle denoting a bullseye was coming up with monotonous regularity.

Spotting Capt. E. C. Crossman, who generally had the answers to anything on the firing line, I asked him, "What goes on?"

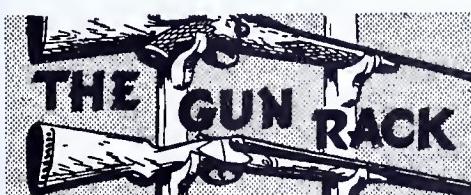
With a smile Cap replied, "We'll see," while we walked down to where the lady had just finished firing. Thus I had my first introduction to Mrs. Cap. Crossman and the Winchester 52.

Mrs. E. C. Crossman was the first woman to make our International Small Bore Team. The next day I watched her hand the Marines a neat

pasting in the Libby Match at 1200 yards with a mean fishtail wind blowing. This is the only match that I know of which has ever been shot at that range in this country. That extra 200 yards does strange things to a bullet in a tricky wind.

The Winchester Model 52 went on to make more shooting history than all other match rifles in the small bore class combined. Not long after, I bought a Winchester 52 and have been a small bore shooter ever since. The first model was rather weird looking when compared to the present model. It had a short stock and so much drop at the comb that with a scope sight you had to crane your neck like a countryman at his first fair. But how that rifle would shoot. The rear sight, following the military pattern, was a folding affair and mounted too far from the eye. But it had micrometer adjustments on the click system that worked. A couple of years later the 52 was improved and a longer stock with higher comb was added for scope sight shooting.

It was with this model that I first made the International Team as a shooting partner of the late Virgil Richards in 1925. I established my first world's record in this match with this combination. Like every other small bore shot of the day I tried out every known combination of rifles in the eternal search for accuracy and still more accuracy. But the fact remained that when I wanted to win, I always came back to the Winchester 52. A perusal of the records shows that this creation of Capt. Laudensack's was for years the mainstay of our International



Small Bore teams and still is second to none.

Through the years the Winchester 52 has been improved without any fanfare. So last year when Winchester announced a new and radically different Model 52, I was all agog to see just how much the Winchester folks could do to improve this time tested rifle. Last winter through the kindness of "Bill Depperman" I received one of the new versions, Micro Trigger and all for try-out purposes.

The first thing that interested me was the entirely new design of the trigger mechanism. All match shots know that one of the most sought after virtues in a rifle is fast striker time with no jars or trigger back lash. Thus trigger mechanisms have been the subject of much research over the years as witness the endless varieties of the market over the past years and at the present time.

It seems that for three or four years Winchester engineers were working on a trigger that would be free of all vibrations. They took all the best existing trigger mechanisms and studied their performance by every means that could be devised. The motions of each part and the vibrations set up by trigger release were studied by high frequency modulated electronic oscillators. High speed photography and all modern laboratory facilities were employed.

Out of this exhaustive research came several experimental models which were given the works. From these results the Winchester boys concluded they really had something. But being wise in the ways of hard boiled small bore shooters they figured it would be smart to let the shooters decide themselves how good it was.

So they took the new trigger and the best existing competitive triggers and fitted them to eleven test guns, all of which looked alike. The guns were identified only by reference to a code number. Then a num-

ber of the country's top small bore shooters were called in to make the test.

To start with the shooters were blindfolded so that no gun could be identified. They were handed the guns at random, sometimes the same gun in succession. They were asked which trigger they liked best on the elements of weight of pull, creep, trigger movement of any kind, vibration or shock and last of all, that elusive element called "feel."

In the second part of the test they were taken to the range and shot the gun any way they desired. The results were conclusive. In both tests the new Micro Motion Trigger was picked so uniformly that no doubt remained as to which trigger the shooters pronounced the best. I believe this is the most critical test ever conducted by a factory.

The Micro Motion Trigger employs a unique system of multiplying levers. An almost imperceptible movement of the trigger, 3-5 thousandths of an inch is increased almost 500% to perform the disengagement of the sear—without any discernible motion or vibration.

There are three adjustments all of which can be made with a screw driver. Two of these are on the outside of the gun where they are readily accessible. One is for trigger travel which runs from zero to .030 inches. The other is for the amount of trigger pull which can be adjusted for any weight running from  $2\frac{1}{2}$  to 6 pounds. The third is inside and the gun must be taken down. This adjustment is for depth of sear engagement and is set at the factory and should not be disturbed.

The next big change is in the barrel bedding system. It employs a barrel to the fore-arm and exerts a straight downward pull which does away with any tendency of the barrel to bind against the stock. The stock is cut away so that the barrel does not touch the wood at all but rests



Winchester's new model 52 features a new trigger mechanism, floating barrel, carburized receiver and newly designed stock.

on three neoprene pads, approximately  $\frac{5}{8}$  inch square and  $\frac{1}{10}$  inch thick. It is free floating at all other points.

The use of carburized steel in the receiver, bolt and firing pin practically eliminates headspace wear which has caused strange doings in .22 caliber match rifles at times. The bolts and triggers are not interchangeable with older models.

The stock is newly designed with a super high comb that is just right for telescope sights. A single shot loading platform is fine for gallery shooting in the dark and the magazine holds 5 shots.

The new gun comes in four styles. The standard weight barrel weighs  $9\frac{3}{4}$  pounds. The heavy weight barrel goes about 11 pounds while the Bull gun goes to the 12 pound limit. There is a sporting version with a light weight 24 inch barrel that weighs 7 pounds.

The one I have is a Bull gun with a Lyman 77H front and a Lyman 525 rear sight. This gun was used most of the winter in the local indoor league matches and won universal praise from the shooters who tried it. On the out doors with EZYX's and good conditions  $\frac{3}{4}$  inch groups were obtained with scope which is what I would expect of this rifle when things are right. Although the trigger is complicated to the layman's eye, this rifle has been fired about 4000 rounds with added dry-snapping, the trigger pull has stayed put, and the trigger mechanism has given no indications of trouble. The gun holds very steady and the broad, serrated trigger makes it very comfortable to shoot.

There is no doubt but what the Winchester boys have produced a masterpiece and my only wail is, "Why didn't they do it when I was an active competitor?"

. . . The End



By Thomas A. Forbes

**T**HE first goal of the steadily increasing number of archers is, understandably, the urge to hit a fixed target.

Unfortunately many archers do not progress beyond this stage. They become experts in registering hits on a target at a known distance and are satisfied to confine the sport within these limitations. This first phase is basic training for all of us and from it we should move naturally to the second stage to increase the pleasure we obtain in participating in the sport.

This phase of archery demands of us that we acquire the ability to shoot with the same accuracy at varying and unknown distances from a fixed target. To the technique which we have already acquired we must add the ability to send the arrow to its mark.

Unfortunately an attempt has been made to divide archers into two distinct groups—target and field archers, and to further limit the field archer to the bare bow and to think of archers who use a sight on the bow as target archers. In fact such attempts to limit the archer in his choice of accessories are doomed to failure. Each of us wants to shoot accurately and that urge will cut across any and all artificial barriers, classifications, and organizations which in the past and to some extent today make it difficult for an archer to participate in all branches of the sport.

On the modern field course archers in increasing numbers are using a sight on the bow. The practise is not limited to newcomers in the

## Moving Targets

sport of archery. Many of the old timers have improved their scores and raised their classification by adapting a sight to their bow; and many so called target archers are now seen enjoying themselves at field shoots.

The ultimate aim of many of the new crop of archers is to use the bow in the hunting field and their practise is directed toward that end. The modern field course and the standard rounds of competition are all based on stationary targets. There is a growing demand among this new group of archers for an opportunity to shoot at moving targets. This is only partially satisfied by the occasional novelty shoot which may include a swinging and or a disappearing target. These shoots are held infrequently. Too little importance has been attached to providing a competitive round which will give archers practise in hitting moving targets. Game can not be expected to co-operate with the bow hunter to the extent that it will stand still on all occasions anymore than it can be expected to remain in the vicinity while the archer measures the distance in yards to his quarry, and sets his sight accordingly.

The concluding phase of our development as archers is to add to our accomplishments the ability to hit a moving target. The bow is a low velocity weapon and to shoot at a moving target is to insure a miss.

Lead, while discussed at length in any gathering of shotgun enthusiasts is really very little understood as it cannot easily be visually demonstrated to the gunner. Chapters and books are written on the single subject of lead but it is extremely difficult for the gun hunter to translate the information into action. Not so

with the archer who observes the light of his arrow as it travels toward the moving target. Any gunner accustomed to shooting at moving targets, upon observing the flight of his arrow under similar conditions, will almost automatically make the necessary physical adjustments in his shooting form to enable him to hit the moving target. In fact he will be delighted in the improved shooting he can do with his gun after he has learned to lead from seeing the result with his arrow instead of reading about lead.

Lead has three components: 1. The speed of the target; 2. The velocity of the missile; and 3. The distance of the shooter from the target. Of these the second and third may for practical purposes be combined and thought of under the general term of distance by considering the velocity of the missile a constant factor.

To compensate for the speed of the moving target on a crossing shot no guess work is required. Bring the bow to full draw behind the target at point A Fig. 26, and swing the bow to match the speed of the target. That takes care of the rate of movement regardless of the speed the target may be moving.

Now to compensate for the remaining factors which we have combined

and designated as distance factors, or the distance to the target from the shooter. Increase the rate of movement of the bow until it passes across and in front of the target and release the arrow while the bow continues in motion. The point R at which the release must be made will quickly be learned by observing the flight of your arrow. (This is the advantage you have over the gunner. He can not see the result when he misses.) Since the velocity of the arrow can be considered constant, the distance from the point of release R back to the target will increase directly in proportion to the distance the archer is from the target.

Last but of primary importance is keep the bow swinging after the release. Call it the follow through if you wish. Any attempt to stop the bow to release the arrow will nullify your previous acts and cause you to miss the target. You will be surprised after the first few awkward attempts that the arrow will register a hit on the moving target with consistent regularity and your bow arm will still be swinging in the same direction the target is moving when the arrow strikes the mark.

To hunt successfully with the broadhead hunting arrow you should use them in practise. Since their power of penetration makes it difficult to pull them from most targets it is well to prepare a target which permits easy withdrawal of the broadhead. Make a rectangular wooden frame of inch boards about eighteen (18") inches by thirty (30") inches and rig it with two V belt pulleys to run on a wire. Cover the front of the target with approximately two (2") inches of upholsterers padding held in place by a piece of canvas. Pack well and attach the canvas firmly to the sides of the frame. Broadheads shot into this target will not penetrate deep into the wood and can be extracted easily.

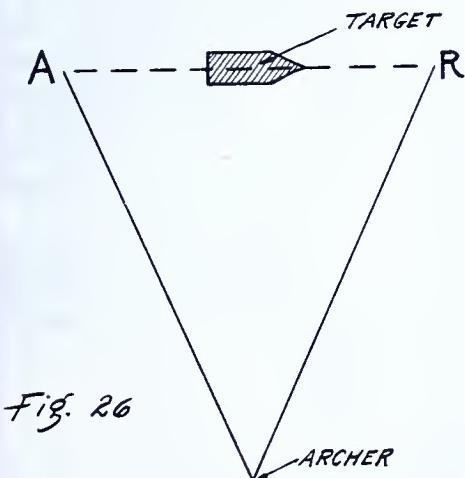


Fig. 26



By Grace O. Beach

It's a funny thing but usually when a woman first goes hunting with the male members of her family, she is given any gun available. There is rarely any thought given to whether or not it is the right type for her use. Later, much later sometimes, she graduates from "hand-me-downs" to a gun of her very own.

Since December is the month of big game hunting and rifles it seems the appropriate time for a little discussion on these guns. There are many types on the market but we will talk about the rifles best suited to the feminine needs, so the ladies of the GAME News family will be more familiar with them.

Most women are conscious of recoil. That is probably due in the first instance to the fact that they have heard their men folks talk about kicking guns, black and blue shoulders and what have you. Apparently this builds up a complex against recoil before a gun is ever fired.

The kick or recoil is caused by the gun pushing backward after firing. Once one learns to hold the gun properly, learns to fall into the proper stance and shooting position naturally, then the recoil becomes a minor consideration with the experience gained.

The .25 caliber guns are light enough for women, yet of sufficient weight so that the recoil is slight. In this class we have the .257 Remington-Roberts. This gun was first designed by Remington and later manufactured by Winchester and some of the foreign gun manufacturers. It is a bolt type action rifle and very

# *A Rifle For Diana*

accurate with either 100 or 117 grain bullets. It can be purchased or made to order in most any weight, depending upon the density of the wood in the stock. However, the average weight is about seven pounds which is just right for hunting purposes.

Serious consideration is always given to the type bullet. For this gun there are a number that can be used, namely, hollow point, silver tip or the mushroom core-lokt which comes in both the 100 grain and 117 grain weight. The 100 grain bullet is probably the more accurate for deer and conditions in Pennsylvania. For the heavier game such as bear or moose it is advisable to use the 117 grain bullet.

The trend today is definitely in favor of a scope on the rifle and this one is very suitable to be used in conjunction with a telescope sight. Scopes are a great aid in singling out or determining the legality of your game. They are an excellent safety measure for a scope user will not mistake a human being for game through telescopic sights. While this mechanical device saves one from carrying a pair of binoculars to use for this purpose, it does not take the place of good binoculars in the field.

You can purchase a Remington-Roberts for around \$85.00 and it will cost about \$150.00 with a satisfactory telescope. Too, you can get this gun in custom-built sportsters if your budget will stand the added expense.

Another .25 caliber gun and an excellent one is the 250-3000 Savage. At one time this rifle was made in bolt action type but today is manufactured



PGC Photos

*Give the gals suitable guns and they'll make an excellent showing in this "man's sport" of hunting.*

in lever action only. The Savage is somewhat lighter in weight and recoil than the .257 and shoots an 87 or 100 grain bullet. The 87 grain bullet is classed as the second most accurate cartridge manufactured today, but for hunting purposes the 100 grain would be most advisable. It carries more punch and zip and will not explode or blow up on the slightest striking of an object in its path.

The Savage can be fitted with a telescope sight and together they make a very satisfactory hunting combination. In the combination they will cost in the neighborhood of \$175.00. Without a scope about \$105.00.

There are on the market other .25 caliber guns such as the 6.5 Mannlicher, but they are not manufactured by regular American Gun Companies.



They can be custom built by private manufacturers and gunsmiths. This cartridge was very popular at one time, then its popularity waned, but it is again gaining favor among shooters. The Mannlicher is a pleasant handling gun, weighing about six pounds, has a true Mannlicher type stock running the full length of the barrel. This gun sells for \$125.00 or thereabout.

The other .25 caliber guns on the market are classified as wildcats. They are termed so, because of the slight changes in the standard case itself which helps to boost the velocity of the bullet and tends to increase accuracy.

For the Diana who does not have an aversion to recoil and the sharper report, but prefers a heavier calibered gun, there are others very popular in the hunting field. For instance the .270 Winchester, actually a .27 caliber gun has gained rapidly in favor the past few years and today ranks at the top in high powered rifles, both for dependability in accuracy and killing power.

The cartridge for use with this gun comes in various type such as the hollow point, silver tip and core-lokt in 100, 120 and 150 grain weights. Probably the most popular grain weight for big game hunting is the 130 grain cartridge.

You can purchase this gun for \$90.00 and up, depending upon the individual taste in the style. A telescope is deemed necessary on such rifles today, because it is a longer ranged gun than our lighter calibered guns and carries up better under wind conditions.

Another rifle which must be considered is the .30 caliber gun. This rifle may be had in 30/06, .300 Savage or 30/30. The '06 comes in bolt action; .300 Savage in bolt or lever action and the 30/30 in lever action as well as bolt action.

In the .30 caliber class the lightest of all and best known is the 30/30 carbine, weighing about five pounds and most easily handled under almost any conditions. It is the best known rifle in this class and least expensive, costing about \$70.00 without scope.

The 30/06, our standard military weapon for infantrymen, is the most popular of all hunting rifles and a wide variety of bullets and grain

weights can be used. It weighs about seven to eight pounds and is ideal for the telescope combination. You will need about \$150.00 to own the combination.

It is difficult to put a finger on the ideal gun because of various hunting conditions, the individuals particular taste in selection—and the game to be hunted. Somewhere, in the above mentioned guns and calibers, the lady will find just the right hunting rifle.

Remember too, that the feminine hunter can use these guns for wood-chuck and crow shooting, giving year-round pleasure. Picking off crows with a rifle is becoming an increasingly popular sport in the field.

Let me point out however, when using a rifle for crowshooting, or any other sport for that matter, ask the permission of the landowner *always*, determine the whereabouts of his family and be careful how and where you shoot.

Safety is the first requisite to happy hunting.

#### Ever Try Venison This Way?

You can do this with beef or veal but venison is extra special. Cut venison in cubes. To two pounds of meat use 2 sliced onions, 1 diced green pepper, 1 small can of tomatoes, and 2 tablespoonfuls of Hungarian paprika. Heat an iron kettle and put in some chopped salt pork, about two ounces, and two tablespoonfuls of bacon fat. When hot add pieces of venison dusted with flour and brown. Remove the kettle from the fire, add the onions and then add the paprika stirring as you sprinkle it over the meat. Return to the fire, add the other ingredients. Cover with a tight lid and cook very slowly over a low flame. Stir frequently to keep the contents from sticking. When the meat is tender thicken the liquid to a medium consistency and season to taste.

. . . *The End*

# A Trapper's Basic Training

By L. J. Kopp

HERE are many peculiar and necessary qualities which go into the making of a good trapper. Acquiring these qualities might be called a trapper's basic training.

Probably the first point to be considered is the trapper's code of ethics. Of paramount importance is a desire to follow humane principles. Regardless of what motivates a trapper, we should at no time overlook the fact that our fur animals are not without some degree of sensation. We should be able to recognize that animals, in their own way, possess a certain amount of pride. A good trapper respects these facts, and therefore makes every possible effort to fully understand modern trapping methods which are designed with these facts in mind. Included in these methods are such important points as: using proper size traps, setting traps in such a way that animals will drown shortly after being caught, regular daily inspection of traps and quickly removing animals from traps. In addition there are other traps and methods which have not yet been fully explored by the majority of trappers.

While it is true that harvesting the surplus is desirable for many reasons, it is equally true that an active interest in the conservation of fur animals has a prominent place in the trappers code of ethics. Strict observance of all regulations governing the taking of fur animals is therefore of prime importance. Where it is

economically sound, a good trapper considers it extremely important to protect the female of the species, particularly during pregnancy or soon after the young are born. Further, the trappers code of ethics strictly forbids the use of any method which would result in mass destruction; or which would result in destruction of the homes or normal shelters occupied by the animals in question.

The ability and desire to respect fellow trappers and other people who share an interest in the outdoors is also important. Here too, observance of various regulations and laws is important. Disturbing the traps of another trapper, or stealing the catch is certainly not in line with a good trapper's code of ethics. On the other hand, killing an animal in another trapper's trap so as to prevent it from escaping is not at all objectionable, provided of course that such an act is properly executed.

There are times when a trapper unknowingly sets traps and interferes in another trapper's territory. In such cases the good trapper usually finds it more practical to discuss the situation with the trapper who is interfering, and more often than not a sound understanding can be reached.

These, then, are the three main points in a trapper's code of ethics. However this is only the first phase of basic training. There are other necessary qualities which make a good trapper.

Almost boundless patience is one of these essential qualities. Some people erroneously assume that a successful trapper is a lucky person who sets a lot of traps. The trapper however knows better. He knows that





a would-be trapper who cannot be patient is seldom a successful trapper.

Learning the habits and characteristics of the various fur animals is in itself not so difficult. Associating these habits with the animals out in the field is a different matter. It is out in the field, the woods, and the stream where you must be able to recognize and understand the where, how, why, and when of animal habits. For many people this may seem complicated, and that is correct. It requires a lot of time and serious study for the trapper to perfect his knowledge of animal habits.

In addition to the normal study of animal habits, there are things which frequently interfere, and in various ways make it more complicated. Such interference may be caused by weather conditions, trap and fur thieves, or unwanted animals. Our own mistakes often help to create problems which require additional patience to correct.

In water trapping there are rising and receding water levels, as well as freezing to contend with. A fox trapper might make a set for fox. Then the ground freezes. Next he might dig the trap out, and reset it with dry dirt to prevent freezing. Then it rains. After that, it freezes again obligating the trapper to remake his set all over. Next he might find an unwanted animal in the trap. Once again the set must be remade. While we are going through all this work, we must be careful not to make any mistakes. We must be patient, for every time we make a mistake we add still more trouble to the problem of catching a fox, should one come along. Now if no fur thief happens to interfere, you have a chance to catch a fox. However if a fur thief should interfere, you my friend, will need some more patience.

Thus we find that patience is an essential quality. It is the key to sound knowledge of animal habits.

Of equal importance are the basic characteristics of the animals involved. To begin with it is necessary that a trapper knows the reason why animals are attracted to his sets. Basically, food is the major want of all animals. I also believe that somewhere in the annals of psychology will find that companionship is another major want of animals. As such we find that scents and urine used at our sets attract animals, because such scent or urine suggest the presence of a companion. For this reason, animals often follow the same trail used by another of their kind. A fox will follow the trail of another, for example.

Animals also possess a pronounced degree of curiosity. A trapper may take advantage of this by using a morsel of food at his set with which the animal is normally not familiar.

When we know why animals are attracted to our sets, we would next want to know how. Most of our animals locate their food with their

sense of smell. In the case of some animals, however, this is not strictly true. A raccoon for example can locate many of his choice morsels underwater by sense of feeling. A fox can locate insects and mice by sound. Sight is also an important asset. But sense of smell is the means by which most animals locate the larger amount of their food.

Since these animals are dependent upon food, it is good to know that, compared to some of our other wildlife, fur animals are not limited to specific diets. Most of our common fur animals such as the fox, skunk, opossum, and raccoon are known as flesh eating animals. This does not mean that they are strictly limited to flesh. They are also fond of the larger type insects such as grasshoppers, various kinds of fruit and ber-

ries, soft corn, and honey. The latter source of food is comparatively limited but nevertheless a great many bee trees, yellow jackets and bumble bees nests are robbed by the coon and skunk. Muskrats on the other hand are vegetarians. During the Fall they store up a good supply of which will keep them during severe weather.

Skunks, opossum, and raccoon have the advantage of being able to subsist without food for several weeks, and even a month or more if necessary during severe winter weather. They subsist wholly upon the fat accumulated during the Fall.

While some of these latter things may appear insignificant they are nonetheless important facts which go into the trapper's basic training.

. . . *The End*

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*Before maturing forests and overbrowsing by deer robbed the varying hare of its food supply "snowshoes" were plentiful in our northern counties. This photo of George Boyer, Royalton, shows an old time bag of McKean County white hares.*



# Pennsylvania Official 1952 Open Seasons and Bag Limits

Open season includes first and last dates listed, Sundays excepted, for game.\* The opening hour for small game on November 1, buck hunting on December 1, and antlerless deer hunting on December 15 will be 9:00 A. M. Otherwise, upland game shooting hours daily are from 7: A. M. to 5:00 P. M., but from July 1 to September 30 inclusive, 6:00 A. M. to 7:30 P. M. (All shooting hours based on Eastern Standard Time.)

		BAG LIMITS	OPEN SEASONS		
	Day	Seasons	First Day	Day	Last Day
<b>UPLAND GAME</b> (Small game possession limits below)					
Bobwhite Quail .....	4 .....	12 ....	Nov. 1 .....	Nov. 15 .....	Nov. 15 .....
Ruffed Grouse .....	2 .....	6 ....	Nov. 1 .....	Nov. 29 .....	Nov. 29 .....
Wild Turkeys (see counties closed below)* .....	1 .....	1 ....	Nov. 1 .....	Nov. 29 .....	Nov. 29 .....
Ringneck Pheasants, males only .....	2 .....	8 ....	Nov. 1 .....	Nov. 29 .....	Nov. 29 .....
Rabbits, Cottontail .....	4 .....	20 ....	Nov. 1 .....	Nov. 29 .....	Nov. 29 .....
Squirrels, Gray, Black & Fox (combined) .....	5 .....	20 ....	Nov. 1 .....	Nov. 29 .....	Nov. 29 .....
Squirrels, Red (closed October only) .....	Unlimited .....		All mos. except Oct.		
Hares (Snowshoe Rabbits) .....	2 .....	6 ....	Jan. 1 .....	Jan. 10 .....	
Raccoons, by individual or hunting party* .....	5 .....	.....	Oct. 15 .....	Feb. 1, '53 .....	
Raccoons, by trapping* .....	5 .....	40 ....	All mos. except Oct.		
Woodchucks (Groundhogs) (closed October only) .....	5 .....	Unlimited .....	Unprot. to Sept. 1, '53 .....		
Grackles (unprotected) .....	Unlimited .....		Nov. 17 .....	Nov. 22 .....	
Bears, over one year, by individual .....	1 .....	1 ....	Nov. 17 .....	Nov. 22 .....	
Bears, as above, by hunting party of three or more .....	2 .....	2 ....	Oct. 15 .....	Feb. 1, '53 .....	
<b>Bow and Arrow Season</b> —Male with two or more points to one antler (requires hunting license and special archery license) by individual* .....					
<b>DEER:</b> <b>Regular Season</b> —Male with two or more points to one antler, by individual* .....	1 .....	1 ....	Oct. 13 .....	Oct. 25 .....	
<b>Antlerless Season</b> —(requires hunting license and antlerless deer license) by individual* .....			Dec. 1 .....	Dec. 13 .....	
			Dec. 15 .....	Dec. 17 .....	

**NO OPEN SEASON**—(Hen Pheasants, Hungarian Partridges, Cub Bears, Elk, Spike Bucks and Otters)

**FURBEARERS:**

Skunks and Opossums .....	Unlimited .....	Unprot. to Sept. 1, '53 .....
Minks .....	Unlimited .....	Nov. 5 .....
Muskrats .....	Unlimited .....	Nov. 29 .....
Beavers (traps only), state-wide* .....	3 .....	Feb. 16 .....
	3 ....	Mar. 7, '53 .....

\* SPECIAL REGULATIONS

**POSSESSION AND TRANSPORTATION LIMITS** of legally-killed small game shall mean not more than the daily limit for the first day nor more than an accumulated total for each succeeding day of the open season for each species; but not in excess of the season limit, regardless of where held, stored or found in possession.

**TURKEYS, COUNTIES CLOSED TO HUNTING**—Adams, Armstrong, Butler, Fayette, Greene, Mercer, Somerset, Venango, Westmoreland and York. In addition, that part of Cambria west of Highway Routes Nos. 271 and 56; that part of Cumberland south of U. S. Highway Route No. 1 to the west shore of the Susquehanna River; and that part of Franklin south and east of U. S. Highway Route No. 11 are closed.

**RACCOONS**—Hunting season begins at 7 A. M. on the first day, and ends at noon on last day (see instructions below concerning trapping). May be hunted day or night, Sundays excepted. The season limit applies to hunting and trapping combined.

**DEER**—Even though there are three separate seasons for taking deer, a hunter may not kill more than one deer during the three combined 1952 seasons, whether hunting individually or with a camp or hunting party. A Special Archery License is required during Bow and Arrow Season, issued only by the Dept. of Revenue, Harrisburg, at a fee of \$2.00. Antlerless Deer Licenses are issued only by County Treasurers, at a fee of \$1.15, and valid only in the County for which issued. Farm occupants permitted by law to hunt without a license may also hunt for antlerless deer during the antlerless season on the same lands as for other game. See Digest issued with hunting license for details. Under the law, no application for an Antlerless Deer License shall be approved, or license issued, to a Nonresident prior to November 15, or after December 14, 1952.

**BEAVERS**—No trapping at Commission-posted dams. Nonresidents may not trap beavers. One person may set, tend or operate 10 traps only. Traps must not be set on the structure of any beaver dam or house, or within 25 feet of the waterline on the structure of either thereof. Tags must be kept above ice or waterline to facilitate identification without disturbing trap. Pelts must be tagged within 10 days after season, and may not be sold or otherwise disposed of until properly tagged. Present them to the Game Protector in District or County where trapped.

**TRAPPING**—Traps for furbearers and raccoons not to be placed, staked or set before 7 A. M. on the first day of the open seasons. The season indicated for Trapping closes at 12:00 o'clock Noon on last day. Traps must be tagged with metal name tags.

**SNARES**—The use of snares is prohibited in all counties except by special permit.

**REGULATIONS FOR UPLAND GAME FIXED BY PENNA. GAME COMMISSION**  
AT MEETING JULY 1, 1952.

1952 HUNTING LICENSE IS VALID SEPT. 1, 1952 TO AUG. 31, 1953, BOTH DATES INCLUSIVE

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# Season's Greetings

*Sincere Wishes for a New Year  
of the best in  
outdoor reading and recreation*

THE PENNSYLVANIA GAME NEWS











